

LEAD THE WAY

BEYOND *LINEAR MODELS*

HOW CAN INDUSTRIES EVOLVE TOWARD MORE
FUTURE-READY INDUSTRIAL SYSTEMS?

Power-to-X optimization
through simulation » 12

Upgrading to peak performance
with a system-wide approach » 52

Transforming into a
future-ready mill » 44

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LEADING THE WAY

Discover the transformation toward future-ready industrial operations.

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“WHAT WE SEE WITH THE HIGH-LEVEL SYSTEMS APPROACH IS REALLY EXCITING; BEFORE, WE USED TO SEE AMBITIONS; NOW WE ARE SEEING EXECUTION AND IMPLEMENTATION.”

”

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SHAPING THE FUTURE

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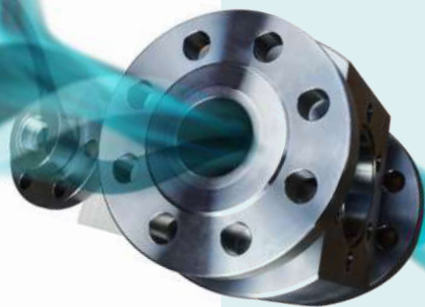
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Revolutionizing plastic recycling with pyrolysis



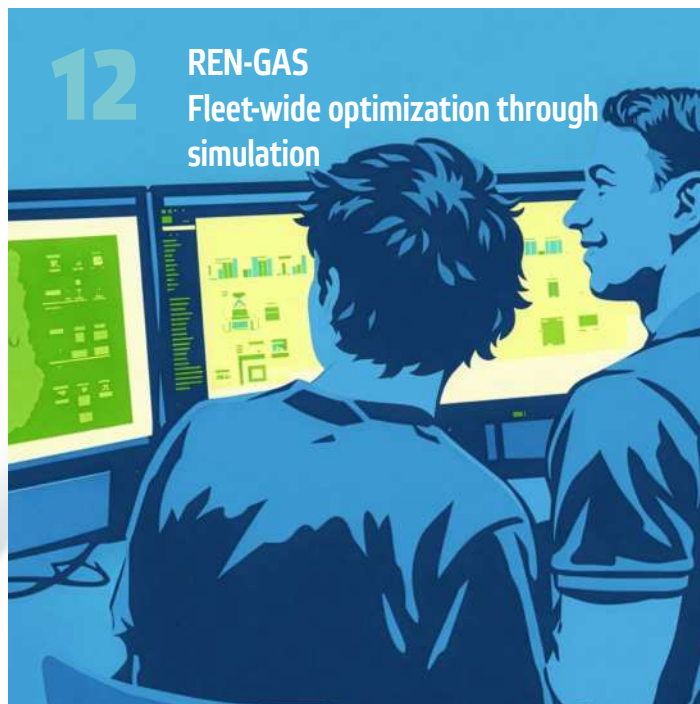
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BEYOND *LINEAR MODELS*

– A NEW BLUEPRINT FOR INDUSTRIAL SYSTEMS

HOW CAN INDUSTRIES EVOLVE BEYOND TRADITIONAL LINEAR MODELS TOWARD MORE FUTURE-READY INDUSTRIAL SYSTEMS? NEXT-GENERATION INDUSTRIAL PRACTICES CAN REDUCE HARM, UNLOCK NEW VALUE, AND SUPPORT THE LONG-TERM RESILIENCE OF INDUSTRIAL OPERATIONS. THE TRANSFORMATION IS ALREADY UNDERWAY AND THE MOMENTUM IS GROWING.





Today,

there is a shift
from traditional
linear and carbon-
intensive business

models to cleaner, decarbonized systems, and this change is accelerating around the world. We talked to **Catherine McFarlane**, Associate Director, Europe and Insights at Mission Possible Partnership, to find out how they, as a global voice across industry sectors, see the current transformation.

“Evolving our current industrial systems to other models is an essential part of achieving net zero goals,” McFarlane says. “Moving away from high-carbon linear models will help us achieve this. Not only that, removing carbon from the system also enables us to create more resilient and competitive systems for our industries, and to develop net zero materials, fuels and chemicals. The transformation is not just about the climate, it’s also about being more competitive and more resilient, especially with the current

volatility in the fossil fuel supply chain.”

VERY POSITIVE MOMENTUM – AROUND 1,000 CLEAN PROJECTS ANNOUNCED

“At Mission Possible Partnership (MPP), we are tracking clean projects with our Global Project Tracker. We have seen more than 1,000 clean projects being announced globally, so there is a really positive momentum behind this change. Of these, 144 projects have already been financed or are already operating. Another 850 projects are still waiting for the final investment decision (FID), so there

is a great investment opportunity out there,” McFarlane says.

“The clean industrial projects that we have identified are projects that have a clear route to near-zero carbon lifecycle emissions, meaning more than 70-80 percent emissions reductions. At MPP, our view is that for these to progress, the issue is less about technology and more about political decisions. The number one obstacle to FID is getting guaranteed demand and offtake, and revenue certainty, for projects. While we see strong voluntary signals, to get the next wave of investments there need to be structural solutions that create a level playing field to enable offtake, and purchase of low-carbon products and decarbonization technology.”

ACCESS TO CLEAN ENERGY IS KEY TO MAKING THE CHANGE

“As process industries begin to move away from traditional models, we can expect to see several types of change. And, while the technologies can be quite different, the pattern of change is similar – this is something that we have seen across different industries, like chemicals, cement, steel, aluminum, aviation and shipping. For transformation to happen in all of these sectors, access to clean

energy is key. This means that there needs to be infrastructure in place that supports clean energy. This has to be available for both the upstream and downstream industries because the transformation happens across value chains, not just in one single sector. Getting alignment across the value chain is especially important when industry needs to champion policy signals. Cross-value chain reinforcement is vital.”

A MULTI-STEP JOURNEY TOWARDS DECARBONIZATION

“There are different approaches to reducing carbon emissions in energy intensive industries. First of all, there are the critical decarbonization technologies and these are the ones that will deliver 70-80% of the decarbonization required to get us to net zero. These technology projects are what we track in our Global Project Tracker. There are also circular approaches like recycling and reuse. And then there are what we call First big step and Last-mile technologies, which can play also an important role in achieving immediate reductions. They are not enough to get to 80% by themselves but they are critical for the decarbonization timeline, and for reach and scale.”

About Mission Possible Partnership



Mission Possible Partnership is an independent NGO advancing global clean industry transformation in the most energy-intensive sectors to enable a critical mass of clean industrial projects to break ground by 2030.

**“THERE NEEDS TO BE
INFRASTRUCTURE IN PLACE THAT
SUPPORTS CLEAN ENERGY
FOR BOTH THE UPSTREAM AND
DOWNSTREAM INDUSTRIES.”**

1



Critical decarbonisation technologies

Core focus and required for bulk of journey to net zero

Major technology routes without which the sector can not reach near net zero (>70-80% emissions reductions across production processes)

- Green H₂-DRI
- CCS
- Electrolysis-based NH₃ (e)SAF production

2

Circular technologies



Needed for full sector decarbonisation, but projects are not always additional

Technologies that reduce emissions through recycling and reuse

- Scrap-based steel
- Scrap-based aluminium
- Plastics / chemicals recycling

3

Last-mile technologies



Required for full sector decarbonisation

Technologies that stack onto critical decarbonisation technologies to deliver the final emissions reduction to reach net zero

- Inert anodes
- Low-carbon alumina
- Ancillary EAF electricity

4

First big step technologies



Important for the clean industry transformation particularly in the short term, provided it does not lock projects into suboptimal assets such as fossil fuel infrastructure

Technologies that yield significant emissions reductions but are insufficient by themselves to reach near-zero

- Partial H₂-DRI
- Calcined clay (SCMs)
- NH₃ process emissions capture
- BF + bio-energy

Graphic and statistics courtesy of Mission Possible Partnership from Global Project Tracker November 2025.

“The cement industry is a very good example of this. In cement making, Supplementary Cementitious Materials (SCMs) can be the First big step, and they are a really important driver in cutting emissions before the critical decarbonization technology needed – Carbon Capture and Storage (CCS) – is widely deployed and available. The Aluminum industry is another example, where clean electricity does a lot of the work. However, to reach true net zero, Last-mile technology is needed, with an additional layer of decarbonization, for example, inert anodes. So even if you have some decarbonization technologies in place, a combined approach is needed, and it takes time to scale.”

CLEAN INDUSTRY NEEDS A WHOLE-SYSTEM PERSPECTIVE

“In industry, the design of new technologies is becoming less wasteful and less dependent on fossil

fuels, often with a circular approach built-in. So, there is a regenerative aspect to them. For example, in the steel industry, there is a large market for secondary steel, which is made using recycled steel, and that should be a priority for the secondary steel market. But there is also a need for higher standard, primary steel, made from virgin iron ore, which is where new technology developments should be focused. Again, when we think about clean industry, it's important to take a full-system approach. You can find many opportunities, especially with emergence of new clean industry hubs and the ecosystems around them. There are mutual benefits across the value-chain.”

THE CLEAN INDUSTRY TECHNOLOGY STACK

“The technology stack for the next generation of net-zero industrial systems varies by sector, but underlying it is a backbone of

Around **1,000** clean projects have been announced globally.

144 clean projects already financed or built.

At least **70** projects worldwide close to the final investment decision (excl. China).

More than **\$1.8** trillion in potential investment opportunities waiting.

Source: Mission Possible Partnership Global Project Tracker Update, November 2025.

“WHEN WE THINK ABOUT CLEAN INDUSTRY, IT’S IMPORTANT TO TAKE A FULL SYSTEM APPROACH.”

clean power, renewable electricity, electrification, improved efficiency, cleaner feedstocks and circularity. Green hydrogen and its derivatives will be relevant in some sectors. CCS will be relevant to sectors like cement and steel. Low carbon fuels like clean green ammonia and methanol will be relevant for shipping, while lower emission

feedstocks, including clean ammonia, and some new bio-feedstocks will go into sustainable aviation fuel (SAF). In addition, AI and digitalization may offer improvements to increase the productivity and efficiency of some of these technologies.”

“In our Global Project Tracker, we can see that clean technology is progressing faster in some sectors than in others. Green ammonia, methanol and SAF have more momentum because of the availability of technologies and also thanks to policy. For example, the SAF blending mandate in Europe, which requires SAF in the fuel mix, has been really important in getting projects through

to FID. There’s a clear supply and demand effect. On the other hand, with cement, there is strong progress with SCM technology, but the deployment of CCS at scale is just not there yet. It’s similar with steel, although China is moving really fast in this and other areas.”

TAKING THE FIRST STEPS TO CLEANER INDUSTRY

“It’s worth noting that while demand is the biggest obstacle in the transformation, this only matters if all other enabling factors are already in place. An effective infrastructure is essential, along with everything preceding it, like permitting and financing.”

“When companies begin shifting to cleaner industrial systems, one of the things we have learned is the value of partnerships across the value chain. For example, a steel company in the automotive chain must engage with both upstream and downstream companies to identify

Catherine McFarlane is Associate Director, Europe and Insights at Mission Possible Partnership.



FOOD FOR THOUGHT

Example 1: World Energy

A good example of a business shifting to clean systems is World Energy in California. They converted an old refinery to produce SAF and repurposed a pipeline to Los Angeles International Airport, rethinking their whole approach to sustainability and emissions reductions.

Example 2: OMV Petrom

OMV Petrom is repurposing an existing refinery infrastructure to produce commercial scale SAF. The project will produce green hydrogen via renewables, waste and bio-based feedstocks. The feedstock supply was secured in the early phases and the business model will have stable demand thanks to the ReFuelEU SAF Blending mandate.

Example 3: Hydro Alunorte

Hydro Alunorte is making a phased transition of an existing industrial asset to sequential new operating models. They have started switching fuels from oil to natural gas, along with electrification and biomass integration, to displace coal, and eventually they plan to move to electric calcination before 2030. This is a very practical pathway to transition from old legacy systems to cleaner, more resilient options based on viable technologies. It will also enable them to achieving deeper decarbonization over time.

Source: Mission Possible Partnership

common barriers, and then they can jointly advocate for their removal. It's important to recognize the value of early collaboration across the value chain."

"For process-industry companies transitioning to cleaner models, some initial steps include identifying where the heavy emissions are and the dependencies in the wider system. Companies can often take early 'no-regret' actions to cut emissions,

and some structural shifts may also be needed – things to engage with and barriers to overcome."

A PIPELINE FULL OF EXCITING DEVELOPMENTS

"We are living in an interesting time for clean industry projects. There is a big pipeline of projects that have been announced. It's exciting that there is such a strong pipeline with trillion-dollar investment opportunities

waiting to be captured. We're seeing great early progress with proven technology, including technology from companies like Valmet. There are clean technologies that are not just linear but also regenerative, and what we see with the high-level systems approach is really exciting. Before, we used to see ambitions; now we are seeing execution and implementation," McFarlane concludes.

**"BEFORE, WE USED TO SEE AMBITIONS;
NOW WE ARE SEEING EXECUTION AND
IMPLEMENTATION."**

VALMET CLIMATE TRANSITION PLAN

LEADING THE SHIFT WITH A ROBUST TRANSITION PLAN

The global climate challenge demands smart industrial transformation. Valmet is answering this challenge with a robust Climate Transition Plan which defines how we support the global shift toward a lowcarbon, circular economy while strengthening long-term business resilience.

At its core, the plan focuses on where Valmet can create the greatest impact: reducing emissions in our own operations, working closely with suppliers to lower upstream impacts, and most importantly, enabling customers to cut emissions and improve resource efficiency across the full lifecycle of their operations.

"Climate action is a driver of competitiveness. By integrating sustainability into innovation, customer collaboration, and investment decisions, Valmet provides technologies and services that help customers reduce energy use, replace fossil fuels, improve material efficiency, and accelerate circularity. This empowers industries to transform toward more regenerative, future-ready production", explains Valmet's VP, Sustainability **Reetta Lopenen**.

CREATING IMPACT THROUGHOUT THE VALUE CHAIN

Valmet's Climate Transition Plan is a practical, forward-looking roadmap that turns ambition into measurable progress while delivering value for customers, society, and the planet.

In the plan, Valmet has set clear, ambitious targets to guide this transition: a 60% reduction of emissions in our own operations by 2030 and net-zero operations by 2040. Across the value chain, our ambition is to reach net-zero by 2050. We also aim for 50% of supplier spend to come from partners with aligned climate targets by 2030, and for 60% of our sales to come from net-zero and circular economy-aligned solutions by 2040. These targets ensure that climate action is embedded in every part of our value chain.

"Our role isn't just to deliver technology; it's to ensure that our customers continue to create lasting value for their stakeholders", Lopenen concludes.

IT STARTS WITH US

UNLOCKING RESOURCE EFFICIENCY

Moving from minimizing harm to actively renewing resources, restoring ecosystems, and building resilient industrial systems.

VALMET'S OWN OPERATIONS

- Commitment to Net zero by 2040
- Design for Circularity principles in R&D
- Minimizing waste and emissions
- Environmental actions at locations.

PROCESS PERFORMANCE SOLUTIONS

- Automation solutions for optimized resource use
- Flow control for efficiency and safety
- Smart monitoring and predictive maintenance
- Digital tools that reduce downtime, waste, and energy.

Examples of Valmet technologies that empower companies to move to cleaner, more regenerative industrial models

Plastic chemical recycling technology based on fast pyrolysis



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Advanced Energy Management for applications including carbon capture and e-methane production



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The BioTrac™ pretreatment system for hydrolysis of biomass into products including bio-ethanol and bio-gas



[READ MORE](#)

Valmet 3D Fiber technology for production of high-quality, three-dimensional fiber packages using renewable cellulose fibers



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ADVANCING CIRCULARITY

TOWARD REGENERATIVE INDUSTRIES

BIOMATERIAL SOLUTIONS & SERVICES

- Closed-loop and recovery solutions
- Improving customers' fiber and energy use
- Fossil-free energy enablement
- Use of recycled raw materials.

INNOVATING BEYOND TODAY

- Recycling technologies for new material value streams
- Carbon capture and storage/utilization
- Next-gen biomaterials
- Industrial electrification
- Partnerships for breakthrough innovation.

FLEETWIDE POWER-TO-X OPTIMIZATION THROUGH SIMULATION



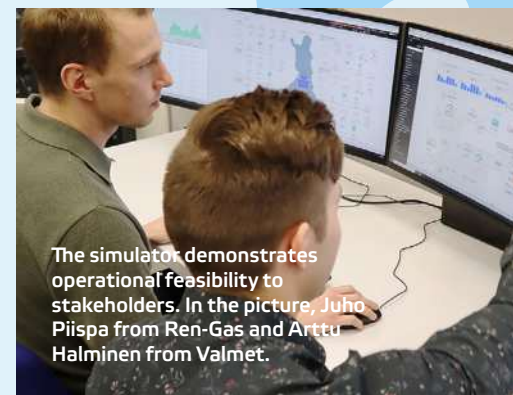
A FULL-SCALE CENTRAL CONTROL ROOM SIMULATOR – A COMPLETE DIGITAL TWIN OF A VALMET DNA AUTOMATION SYSTEM AND FUTURE PRODUCTION PROCESSES – ENABLES NORDIC REN-GAS TO TEST AND OPTIMIZE ITS POWER-TO-X (P2X) OPERATIONS.

BY 2030, Nordic Ren-Gas, Europe's leading P2X developer, is planning to build a green hydrogen and e-methane production network comprising several plants in Finland. This will support decarbonization by replacing more than 250 million liters

of fossil fuel annually and reducing CO₂ emissions by more than one million tonnes.

"Although each plant will operate autonomously, fleet optimization and energy market participation will take place in a central control





room. This will act as the brain of our business operations,” says **Aleksi Sipilä**, Automation Manager at Ren-Gas.

Ren-Gas will run their production processes on renewable energy. They will utilize CO₂ emissions through carbon capture from energy plants, and transfer excess heat from their electrolyzers, and from their carbon capture and methanization processes, for use in local district heat networks.

SIMULATING REALISTIC PROCESS BEHAVIOR

Based on pre-engineering studies conducted with several suppliers, Ren-Gas selected Valmet. The focus of their joint efforts has been on enabling flexible production control and centralized energy management across the future Ren-Gas fleet.

The central control room simulator at Ren-Gas will be a complete digital twin of a Valmet DNA Automation System and the future production processes. This will enable the company to train and prepare its team for full-scale operations and evaluate different data-driven production strategies in a safe environment.

“The simulator provides a hands-on environment where our team can simulate our full portfolio of operations, assess different control strategies, and refine how we work,” says Sipilä. “It’s very important for our risk management. Based on the simulator, we’ll also be able to define our requirements later for the actual central control room system required in the production phase.”

SUPPORTING FLEETWIDE OPERATIONS

By modeling systemwide behavior, the control room simulator supports the operation of every plant in the fleet. This allows Ren-Gas to simulate, coordinate, and optimize performance across locations, responding to supply and demand variability, and improving overall efficiency.

“We want to ensure that our operating model is ready to meet real-world conditions from the outset,” adds Sipilä. “The ability to test, refine, and align our operational workflows in advance is one of our key success factors.”

Ren-Gas also uses the simulator to demonstrate the project’s feasibility to stakeholders. “We can show that our plans are by no means utopian.

Every investor wants to support the green transition, but it must be profitable for them,” says Sipilä.

ADVANCED ENERGY MANAGEMENT

Valmet provided energy management consultancy to ensure the simulator met Ren-Gas’s strategic and technical requirements. The focus was on integrating energy management features into the broader automation architecture, including load balancing and renewable integration, as well as third-party systems such as electricity price forecasting.

Once up and running, the Ren-Gas fleet will consume green energy in its operations. “Based on wind and solar energy production forecasts, the system will carry out fully automatic production planning. This will enable us to utilize renewable sources effectively while benefiting from cheap excess electricity on the market,” says **Antti Alahäivälä**, Development Manager at Ren-Gas.

“Our energy management system (EMS) consultancy helps customers turn technology into an operational asset,” says **Jyri Kaivosoja**, Senior Product Manager, Automation Systems, Valmet. “Valmet’s Energy Management System (EMS) plays a



"Although each plant will operate autonomously, fleet optimization and energy market participation will take place in a central control room. This will act as the brain of our business operations," says Aleksí Sipilä, Automation Manager at Ren-Gas.

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& READ THE
FULL ARTICLE**



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VIDEO**



Ren-Gas will continue developing and updating the central control room simulator in collaboration with Valmet. From left in the photo: Mikko Kukkonen, Jyri Kaivosoja and Arto Mäkinen from Valmet, Antti Alahäivälä, Juho Piispa and Aleksí Sipilä from Ren-Gas, Arttu Halminen and Tiina Stenvik from Valmet.

"THIS PROJECT DEMONSTRATES HOW SMART AUTOMATION AND THE ENERGY TRANSITION GO HAND IN HAND, SHOWING WHAT'S POSSIBLE WHEN OPERATIONAL STRATEGY AND DIGITAL CAPABILITY ARE DEVELOPED IN PARALLEL."

The delivery is based on Valmet DNA technology and related services, including:

- Virtualized Valmet DNA DCS
- Valmet DNA User Interface
- Valmet DNA Energy Management System (EMS)
- Valmet DNA Advanced Process Controls
- Valmet DNA Information Management
- SCADA solutions
- Integration with multiple third-party systems and detailed process modeling for six plants
- Energy management consultancy
- UX and workflow consultancy

key role at Ren-Gas. Without it, the fleet's autonomous control would be impossible, as it carries out adaptive production planning."

SMART AUTOMATION AND THE ENERGY TRANSITION

Ren-Gas and Valmet completed the factory acceptance test (FAT) phase of the central control room simulator during spring 2025, after which the system was transferred to Ren-Gas's facilities in Espoo.

"The FAT phase met our expectations. It involved a lot of fruitful discussions in which both parties brought new ideas," added Alahäivälä. "We have seen how Valmet is truly interested in working with us – not only as a technology supplier but as a partner who is eager to move things forward."

"This project demonstrated how smart automation and energy transition go hand in hand," concluded Valmet's Jyri Kaivosoja. "It showed what's possible when operational

strategy and digital capability are developed in parallel."

Ren-Gas has continued to develop and update the central control room simulator together with Valmet. It remains a long-term platform for ongoing system development, operator training and control strategy evolution.

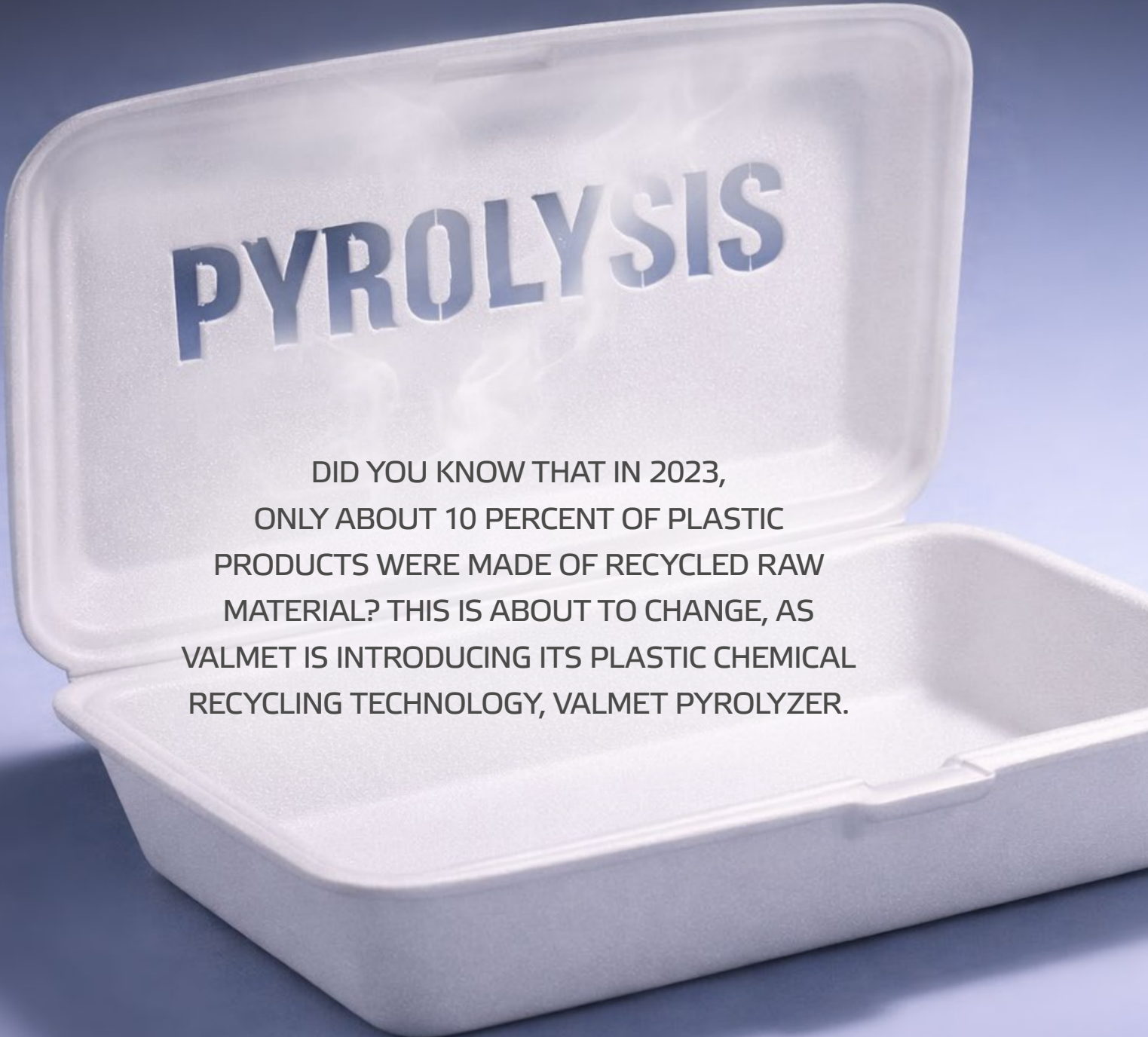
The purpose of the development partnership is to combine the expertise of Valmet and Ren-Gas in developing automation, simulations, digital solutions and operations for P2X plants, to improve their performance and profitability. It also aims to support the progress of Ren-Gas's projects.

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REVOLUTIONIZING PLASTIC RECYCLING WITH



PYROLYSIS

DID YOU KNOW THAT IN 2023,
ONLY ABOUT 10 PERCENT OF PLASTIC
PRODUCTS WERE MADE OF RECYCLED RAW
MATERIAL? THIS IS ABOUT TO CHANGE, AS
VALMET IS INTRODUCING ITS PLASTIC CHEMICAL
RECYCLING TECHNOLOGY, VALMET PYROLYZER.



Valmet's innovative in-house testing facility and pilot plant is located in Tampere, Finland. Its new industrial-scale pyrolysis plant will be ready in 2027.

PLASTICS ARE STILL an essential part of our everyday life, and recycling them is key to meeting global sustainability and circular economy targets. With efficient recycling, we can significantly reduce the use of fossil oil and release less carbon into the atmosphere.

Traditionally, plastics have been recycled using mechanical recycling, which efficiently handles the types of plastics required to make products like shopping bags, buckets, and garden tools. However, it doesn't meet the strict quality requirements for certain uses such as food packaging. In contrast, chemical recycling significantly expands the usability of recycled plastic.

Valmet has introduced a new plastic chemical recycling technology based on fast pyrolysis. Pyrolysis is a thermochemical conversion process in which feedstocks such as mixed plastic waste are decomposed into gases, liquids, and solid residues in the absence of oxygen. The liquid fraction, known as pyrolysis oil, can be further upgraded for use in downstream petrochemical processes, where it serves as a feedstock for producing virgin-quality plastics. These recycled plastics are suitable for demanding applications, including contact-sensitive and other quality-critical uses.

"In other words, through pyrolysis, even multilayer packaging, contaminated materials, and mixed plastic streams that have traditionally been difficult to handle can be converted into high-quality raw material for new plastic products," summarizes **Pekko Marjomaa**, Product Sales Manager, Pyrolysis at Valmet.

DECADES OF PYROLYSIS EXPERTISE

Valmet has a long history in pyrolysis technology development, and extending the technology's use to chemical recycling supports Valmet's goal of transforming industries for a regenerative tomorrow.

"In a nutshell, our pyrolysis technology leads to improved recycling efficiency, meets stringent plastic

**WITH VALMET PYROLYZER,
MIXED PLASTIC STREAMS
CAN BE CONVERTED INTO
HIGH-QUALITY RAW MATERIAL.**



Arttu Tolvanen and Pekko Marjomaa say that chemical recycling significantly expands the usability of recycled plastic.

recycling targets, and recycles various plastic types such as polyethylene (PE), polypropylene (PP), and polystyrene (PS) effectively. Valmet Pyrolyzer is based on fluidized bed technology, which we know by heart. It's highly reliable and scalable, offering exceptional flexibility and allowing both thermal and catalytic process configurations for different operational setups," says **Arttu Tolvanen**, Product Engineer, Pyrolysis at Valmet.

Arttu Tolvanen and Pekko Marjomaa say that chemical recycling significantly expands the usability of recycled plastic.

Valmet's technology can be scaled to large industrial capacities above 100 kta in a single unit, thanks to the excellent heat transfer inherent in fluid bed systems. This scalability reduces both capital and operating costs, enabling economically viable industrial-scale chemical recycling.

"Moreover, we've adopted a comprehensive lifecycle approach, offering everything from key technology and automation systems to maintenance and spare parts – helping our customers achieve their circularity targets easily," Marjomaa adds.

INDUSTRIAL-SCALE PILOTING AIDS INVESTMENT DECISIONS

Valmet operates an innovative in-house testing facility and pilot plant in Tampere, Finland. At the heart of this R&D Center is the world's largest catalytic bio pyrolysis pilot plant, commissioned in 2023. Valmet is currently expanding its facility with a new industrial-scale pyrolysis plant, offering infrastructure that bridges the gap between lab-scale trials and commercial deployment of plastic recycling—supporting customers' investment decisions



with real-life data. The new industrial-scale pyrolysis plant is scheduled to be ready in 2027.

“The new pyrolysis plant enables different feedstocks, optimizing catalysts, and validating energy and emission metrics to be explored before full-scale investments. By combining our cutting-edge technology with true customer process parameters, we will enhance safe, efficient, and scalable chemical recycling solutions for our customers, accelerating the transition to a true circular economy,” says **Jaakko Martikainen**, Director, Circularity Growth, Energy and Circularity, Valmet.

To summarize: With scalable technology, real-world testing capabilities, and comprehensive lifecycle support, Valmet is ready to help its customers turn today's plastic waste challenges into tomorrow's competitive advantage. Valmet Pyrolyzer brings chemical recycling within reach, enabling companies to meet stricter regulatory demands while building a more circular and sustainable business.

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Toward the EU's plastic recycling target through pyrolysis

- The European Union has set a plastic recycling target in which more than 55% of packaging plastic will be recycled by 2030
- The EU also mandates that food packaging must contain at least 10% recycled plastic
- To meet this, Europe needs to chemically recycle about 2.5 million tonnes of plastic annually
- Pyrolysis is key to achieving these ambitious targets – and even higher goals, like 25% – by 2040.

**VALMET PYROLYZER OFFERS
FLEXIBILITY, ALLOWING BOTH
THERMAL AND CATALYTIC
PROCESS CONFIGURATIONS.**



THE ENERGY TRANSITION

VALVES AT THE HEA

DISCOVER THE POWER OF FLOW CONTROL INNOVATIONS AND HOW THEY PLAY A CRITICAL ROLE IN SHAPING PROGRESS ACROSS THE GLOBAL ENERGY TRANSITION. MANY APPLICATIONS DEPEND ON PROVEN VALVE SOLUTIONS IN SEGMENTS THAT CONTRIBUTE TO CUTTING CARBON FOOTPRINTS AND CURBING GLOBAL WARMING.

THE OUTLOOK FOR the energy transition is challenging to say the very least. International Renewable Energy Agency (IRENA) reporting states that if global warming is to be limited to 1.5 °C, carbon dioxide (CO₂) emissions will need to be cut by around 37 gigatonnes (Gt) from 2022 levels, and net-zero emissions will need to be achieved in the energy sector by 2050. This in itself is a huge task.

Unique metal matrix composites perform well in sticky and abrasive situations.



Piotr Kulisz
Director, Service, Europe,
Valmet Flow Control



Andreas Pischke
Global Industry Manager,
Valmet Flow Control

RT OF THE MATTER

Here, **Piotr Kulisz** and **Andreas Pischke**, Valmet Flow Control business, look at key flow control technologies for applications in the energy transition, including sustainable aviation fuel (SAF) production, carbon capture, utilization, and storage (CCUS), hydrogen production, and plastics liquefaction.

BATTLING SKY-HIGH AVIATION EMISSIONS

While electric vehicles are expected to dominate road transportation, and methanol marine transportation, the aviation sector holds the most promise for biorefining and the subsequent shift to SAF.

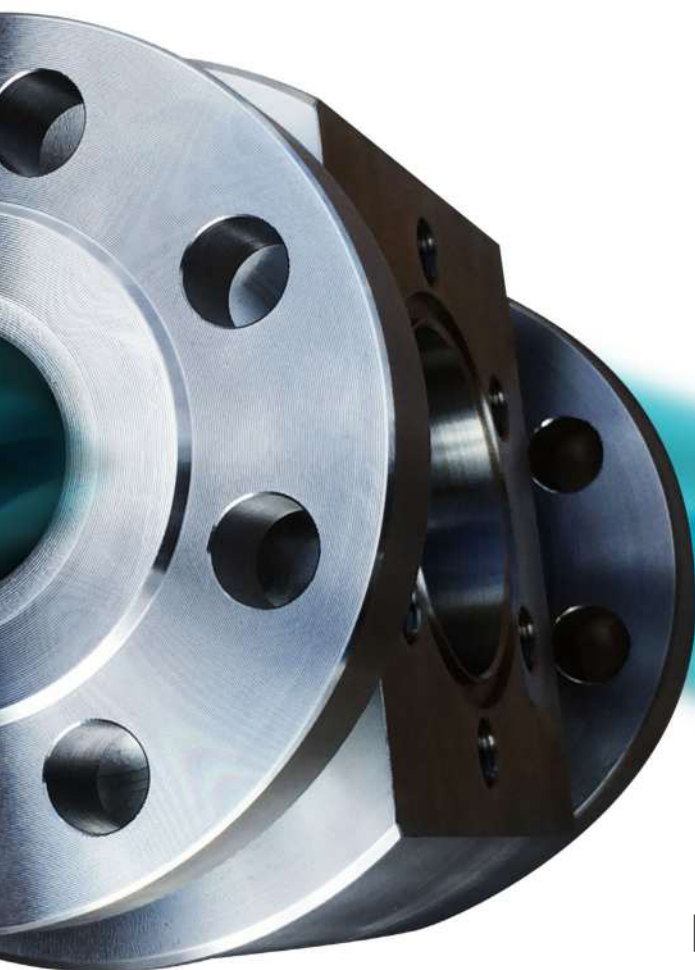
Many SAF production pathways include processes similar to conventional refining, including hydrotreating, hydrocracking, isomerization, and fractionation. Feedstocks can include biomass, vegetable oils, animal fats, and used cooking oils, each of which brings its own challenges. They require valves with special alloys and hard facing and firesafe designs to ensure safe and uninterrupted performance. To secure long-term reliability in dehydration processes, metal-seated ball valves with unique closed and

scraping seat designs and high-cycle actuators, coupled with high-capacity intelligent controllers, are strongly recommended. Triple-offset eccentric disc valves with metal seats protected from the shear force of the process fluid and mechanically induced tightness can also be a viable option.

CAPTURING NEW OPPORTUNITIES

The CO₂ separation processes used in modern carbon capture technologies each have their own set of requirements, whether for post- and pre-combustion, oxyfuel combustion, or cryogenic separation.

CO₂ removal processes that use amine-based absorption present valves with corrosive conditions and high temperatures and pressures, while high concentrations of H₂S and CO₂ require material selection



**"PROVEN FLOW
CONTROL SOLUTIONS
ARE AVAILABLE
TO ADDRESS THE
CHALLENGES
OF TODAY'S
ENERGY TRANSITION.**

according to NACE. Depending on the absorber pressure, the pressure drop across the valve can reach up to 170 bar. For severe service in pressure swing adsorption (PSA) and thermal swing adsorption (TSA) applications, high-performance butterfly and ball valves are a proven solution.

HANDLING EXTREMES

Hydrogen and its carrier gases such as ammonia and methanol play an increasingly important role in the power-to-X value chain, but they pose several unique challenges. Hydrogen is highly flammable, requiring fire-safe valve design, and the extremely small molecular size of hydrogen and high toxicity of ammonia make it difficult to maintain the valve's internal tightness and control fugitive emissions. Hydrogen is also known to significantly degrade some material properties and reduce the damage tolerance of some valve components. While extremely low temperatures occur when using liquid hydrogen, high pressures occur during ammonia synthesis.

Fire-safe high-performance butterfly valves designed for high temperatures of up to 800 °C, as well as special cryogenic seat designs and special extensions, including high yield strength shafts and low-emission seal designs, have proven themselves in these conditions.

ENABLING PLASTIC RECYCLING

Plastics liquefaction is one of the pivotal methods for recycling plastic, and the process requires valves that can handle diverse feedstocks. Regardless of the technology used – whether pyrolysis, gasification, depolymerization, purification, or hydrothermal – all involve high (and sometimes extreme) temperatures and pressures, as well as viscous and corrosive media, and the presence of hard abrasive particles.

Plastic melt valves handle a critical application here. Heavy-duty ball valves with a hard-coated scraping

seat design are the optimal choice for the management of sticky fluids containing hard particles, temperatures of up to 450 °C, and a pressure class of ANSI 1500.

TECHNOLOGY IS AT THE HEART OF CHANGE

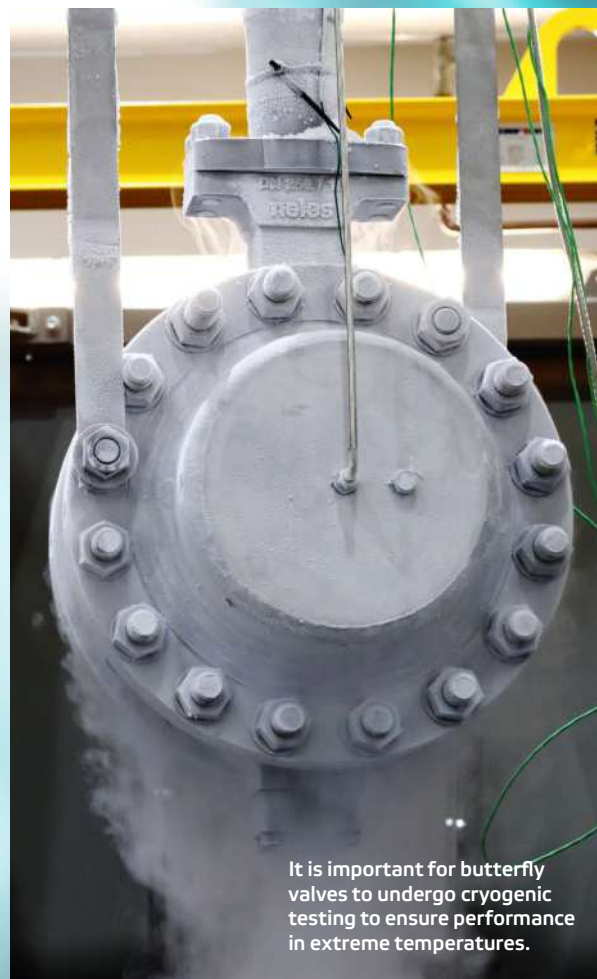
At the heart of every application discussed in this article are valves that regulate the flow of media throughout the process. These valves' performance directly affects the performance of the entire process itself. Irrespective of the challenges posed by today's energy transition technologies, field-proven flow control solutions are available to address them reliably, efficiently, and sustainably.

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It is important for butterfly valves to undergo cryogenic testing to ensure performance in extreme temperatures.

**VALVE PERFORMANCE
DIRECTLY AFFECTS
THE PERFORMANCE OF
THE ENTIRE
PROCESS ITSELF.**



Valmet's Neles™ X series ball valve is a technology suitable for applications related to SAF production.

Valve solutions play a vital role in many crucial applications in the energy transition.



WHERE CIRCULARITY MEETS RELIABILITY:



REINVENT

THE PRESS



VALMET HAS REVAMPED ITS PRESS ROLL COVER FAMILY WITH NEW BIONEER SOLUTIONS THAT ADVANCE CIRCULAR AND REGENERATIVE PRACTICES BY INTEGRATING RECYCLED, RENEWABLE, AND BIOBASED MATERIALS INTO HIGH-PERFORMANCE ROLL TECHNOLOGY.

VALMET'S BIONEER PRODUCTS provide a more sustainable alternative to conventional products by incorporating recycled, renewable, or biobased materials. Building on the successful launch of the Bioneer press felt in 2025, Valmet is now expanding the portfolio with a revamped range of press roll covers.

MAKING THE CHANGE WITH MATERIAL CHOICE

"For decades, we've focused on developing products that enhance the resource and energy efficiency of our customers' processes – whether through a long lifetime, improved dewatering, or energy savings. At the same time, we've always believed we could go further. That's why we've continued to pursue more sustainable material choices without compromising the excellent quality our customers rely on. We're now ready to introduce the new Bioneer press roll cover family with a reduced carbon footprint," says **Ulla Kanerva**, Global Technology Manager, Roll Covers and Maintenance at Valmet.

NTING

ROLL COVER

Valmet roll experts in front of the suction roll with the new Bioneer cover.



QUALITY ALWAYS COMES FIRST

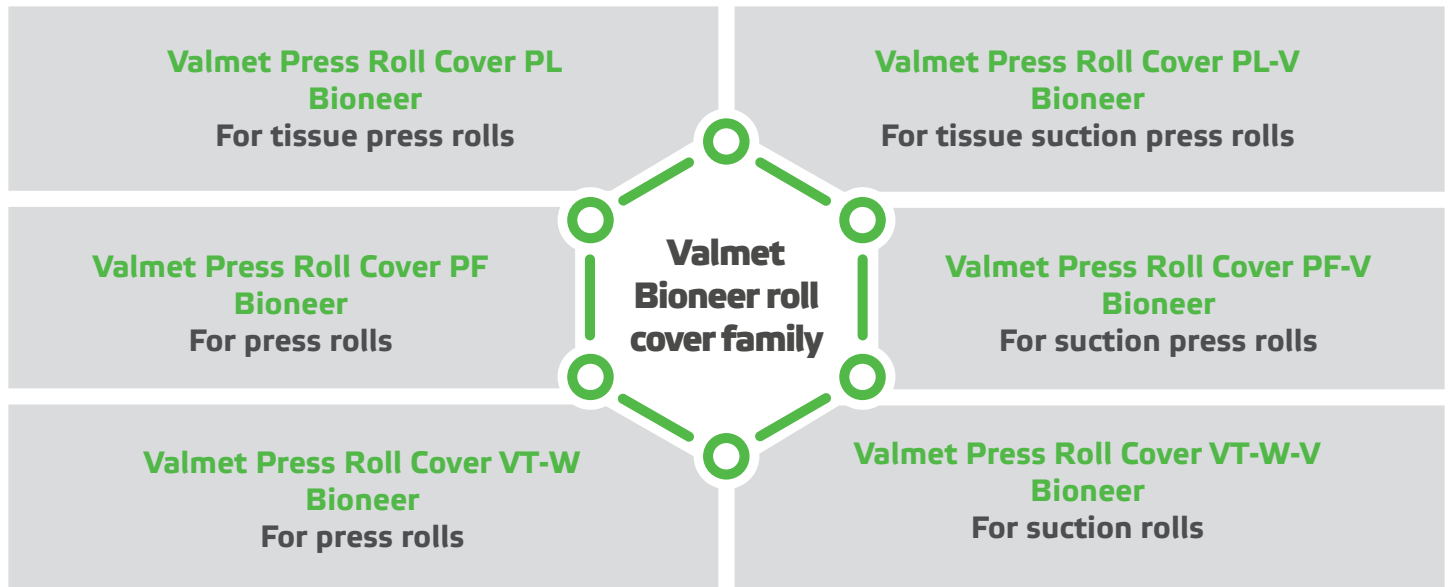
The new Bioneer roll covers are designed for a wide range of press and suction roll applications on board, paper, tissue, and pulp drying machines. The innovative roll covers incorporate recycled, renewable, or biobased materials, without compromising durability, wear resistance, or dewatering performance.

**“BIONEER ROLL COVERS
HAVE DEMONSTRATED
EXCELLENT
PERFORMANCE AND
A LONG LIFETIME IN
REAL OPERATING
CONDITIONS.”**

“The polyurethane covers, Valmet Press Roll Cover PF/PF-V Bioneer and PL/PL-V Bioneer, have the same consistent quality as our traditional PF and PL press roll covers, and they’re available in the same hardness range and surface topography options, offering excellent wear resistance and dewatering capabilities. A mass balance approach is used to apply recycled, renewable, and biobased materials in their production, offering a way of reducing the overall share of fossil materials in products,” says **Sanna Junttonen**, Global Product Manager, Roll Covers and Maintenance at Valmet.

“The composite covers, Valmet Press Roll Cover VT-W Bioneer and VT-W-V Bioneer, are designed for grooved and blind-drilled press roll applications. They’re tough, impact- and crack-resistant cover solutions that hold their properties in demanding process conditions. The new composite solution utilizes biobased epoxy, incorporating recycled PET polyester fibers sourced from used plastic bottles and recycled glass powder, adding up to 56 percent of biobased and recycled materials, thereby reducing virgin material dependency and supporting circularity,” Junttonen continues.

Customers have already shown strong interest in the next generation of press roll covers. In line with Valmet’s standard product development practices, the Bioneer roll covers have been trialed at several customer mills ahead of



the official launch – demonstrating excellent performance and a long lifetime in real operating conditions.

LIFE CYCLE ASSESSMENT INCLUDED

Valmet's Bioneer roll covers are accompanied by a product-specific life cycle assessment (LCA), providing customers with transparent and credible climate impact data. For example, the new Valmet Press Roll Cover PF Bioneer offers up to 12.2 percent lower cradle-to-gate CO₂ emissions than traditional products.

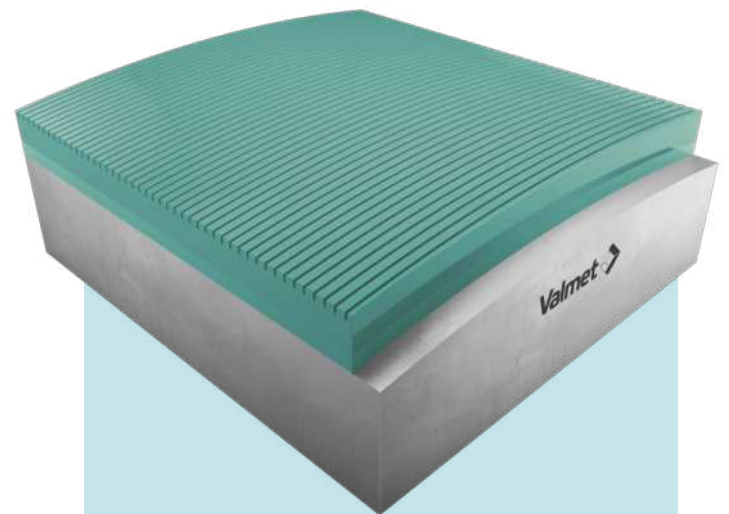
"With the transparent LCA data, we can help our customers compare the climate impact of different products, make informed decisions, and demonstrate measurable progress toward their climate targets," Junttonen says.

Valmet's customers are increasingly seeking solutions that help them improve their machines' performance while meeting their sustainability targets.

"With the Bioneer roll cover family, we can offer both high-performance technology and verified climate impact data. This strengthens our role as a global roll cover technology leader and as a trusted partner in sustainability – something we're truly proud of," Kanerva concludes.

CONTACT

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Reducing the carbon footprint

Valmet's Bioneer products are designed to reduce the carbon footprint of paper, board, tissue, and pulp production. By incorporating recycled, renewable, or biobased raw materials through a mass balance approach, they reduce reliance on fossil-based inputs while maintaining the same high performance, durability, and dewatering efficiency as conventional products.

Product-specific life cycle assessments verify lower cradle-to-gate CO₂ emissions than traditional alternatives. With Bioneer, Valmet combines sustainability, transparency, and operational reliability to support customers' climate and circularity targets.

A man with a beard and mustache, wearing large black and yellow headphones and a white safety helmet, is smiling and looking towards the left. He is wearing a grey t-shirt. In the foreground, the back of another person wearing a yellow safety vest and a white helmet with a clear face shield is visible. The background is a blurred industrial setting with large windows.

BUILDING

THE RESPONSIBLE FUTURE OF

PACKAGING



Cooperation between Kivanç Paper and Valmet has been exceptional during the project.

BACKED BY DECADES OF EXPERTISE IN THE TEXTILE INDUSTRY, KIVANÇ PAPER DECIDED TO TAKE A MAJOR STRATEGIC LEAP BY ENTERING THE BOARD MANUFACTURING INDUSTRY, WITH THE GOAL OF CONTRIBUTING TO THE LOCAL ECONOMY AND SUSTAINABLE BOARD PRODUCTION.

AT THE CORE OF THIS GREENFIELD MILL investment are Valmet's innovative technologies, many of which have never been seen anywhere in the world before.

The board making line delivery included an OCC line, stock preparation and white water treatment, board machine PM 1 from headbox to reel and winder, and services and automation for the entire mill. The line started up successfully in the fall of 2024, and the results have been world-class: the board's quality and strength properties are superior compared with those of competitors. "We are doing something different than other paper mills in Türkiye. We are using the same raw materials and the same chemicals, but we are producing much stronger board than our competitors," says **Ali Karagöl**, Technical Director at Kivanç Paper.

BACKGROUND IN THE TEXTILE INDUSTRY

Although Kivanç Paper is a newcomer to papermaking, the company brings decades of experience from the textile industry, giving it a strong foundation in a highly competitive business environment. Operating in a sensitive industry such as textiles is challenging: it is heavily influenced by trends, global consumption patterns, and political fluctuation. According to **Ziya Kivanç**, the Chairman of the Board at Kivanç Group, thinking ahead and diversifying the business risk are important. "As Kivanç Group, we have never focused solely on today; we have always thought at least ten years ahead. In textiles, we built a system that supplies major European and American fashion brands with high-quality sustainable fabrics. Kivanç Paper is a natural extension of this vision, of long-term thinking, and creating value for our country," says Kivanç.

At the core of the company's values is a commitment to the creation of a more sustainable packaging industry, while addressing the growing demand for packaging. The



mill produces recycled fluting and liner by transforming wastepaper into raw material and contributing to the circular economy. According to Kıvanç, reducing the environmental impact of the business requires leveraging innovative technologies. “We use state-of-the-art equipment that delivers high efficiency and low emissions. In other words, we are not only addressing the growing demand for packaging; we are doing so in a way that fully aligns with sustainability requirements such as the European Green Deal,” says Kıvanç.

INNOVATIONS THAT MAKE A DIFFERENCE

When planning the board machine investment, Kıvanç Paper wanted to choose technologies that would make a difference in the future and provide a competitive advantage. PM 1 includes several new innovations that can't be found anywhere else in the world.

From the very beginning of the project, it was very important for Kıvanç Paper to have the same supplier

for both the OCC line and board machine to ensure the seamless usability of the machine line. “We selected Valmet so we would have the same supplier for all divisions of the project,” says Karagöl. “We also had discussions with many other suppliers in the beginning, but we have previous experience of Valmet, and they really are the best when considering board machine suppliers.”

The seamless operation of the mill and technologies is ensured with a Valmet DNA automation system. “When considering the overall efficiency of the board machine, automation's role is very important. Right now, everything is being digitalized. So, a good understanding of production is very important,” Karagöl says.

AN ENERGY-EFFICIENT OCC LINE

Part of Valmet's delivery was an Old Corrugated Containers (OCC) line, a bale pulping line with Valmet Conical Refiners and a high-consistency pulping line. A white water system with a saveall broke thickener, under-

**“WE’RE USING THE SAME
RAW MATERIALS AND THE SAME
CHEMICALS, BUT WE’RE PRODUCING
MUCH STRONGER BOARD.”**



Kıvanç Paper selected Valmet for both the OCC line and board machine to ensure the machine line's seamless usability.



Valmet's delivery for the stock preparation included an Old Corrugated Containers (OCC) line, a bale pulping line, and a high-consistency pulping line.



The mill produces recycled fluting and liner by utilizing recycled wastepaper as raw material.



OptiSizer Hard ensures the board's strength properties and eliminates the need for calendering.



the-machine pulpers, and several Valmet Conical Refiner units were also delivered. The main benefit of the OCC technology is its low energy consumption. "Due to Valmet's good equipment, we do not need to use energy-intensive processes such as dispersion to remove stickies from the system," explains Karagöl. "Valmet Drum Pulper, selected after careful evaluation and reference visits, provides gentle slushing without chopping fibers or breaking contaminants into smaller pieces that could pass to later stages."

The line is further supported by proven coarse screening and low-consistency cleaning technologies, including Valmet Twister Hydrocyclones. "We can run the Twister cleaners at up to 2–2.5 percent consistency, which gives us great flexibility. The equipment has been reliable, with no major maintenance issues," Karagöl says.

WET END TECHNOLOGIES REDUCE MATERIAL COSTS

Kıvanç Paper chose an OptiFlo Layering Fourdrinier headbox with Aqua layering technology to ensure the quality of the board and reduce material costs. "With Aqua layering technology, you can dose the chemicals less than the other technologies because you are directly dosing inside the layers of the paper. It also allows you to play with the top and bottom layer ratio. The layer purity, especially in the liner grades, has been excellent," says Faruk Özşerbetçi, Paper Mill Director at Kıvanç Paper. Together with hybrid former, the layering headbox offers flexibility when producing multiple grades.



Ali Karagöl, Technical Director at Kıvanç Paper.



Faruk Özşerbetçi, Paper Mill Director at Kıvanç Paper.



Ziya Kıvanç, Chairman of the Board at Kıvanç Group.



Ramazan Tekin, Production Director at Kıvanç Paper.

“WITH AQUA LAYERING TECHNOLOGY, YOU CAN DOSE THE CHEMICALS LESS THAN OTHER TECHNOLOGIES.”

To reduce the energy consumption of the wet end, Kivanç Paper invested in a new digital solution Valmet Uhle box Vacuum management system. The application has been developed in collaboration between Kivanç Paper and Valmet during the project. It automatically regulates the vacuum levels in the press section to ensure consistent dewatering performance, making operators' work easier. "It is a very good tool to use. It allows you to use less energy in the vacuum area, which is the second-biggest energy consumer in the paper machine. The vacuum management system also reduces the process variation because we always know what the vacuum level is," explains Karagöl.

ENSURING STABLE CLOTHING PERFORMANCE

Ever since the start-up, the machine has been running with Valmet Paper Machine Clothing. Kivanç Paper has been especially satisfied with the support they have received from Valmet with the clothing, and plan to continue the cooperation through a fabrics agreement in the future. "It can take time to find the correct configuration with felts and forming fabrics. That is why we want to use well-known products and suppliers so we can ensure their performance," says **Ramazan Tekin**, Production Director at Kivanç Paper.

NEWEST DRYING AND SIZING INNOVATIONS IN THE WORLD

The dryer section of PM 1 features a new compact geometry where the vacuum roll is closer to the dryer cylinder. This shortens the distance between the two, enhancing runnability and drying efficiency. "It is a very efficient dryer section. When you look at steam consumption per tonne, it is very good, less than guaranteed figures," says Tekin. "Also, our tail threading is so fast. That's why we haven't seen any bottlenecks or problems with this," says Özşerbetçi.

To ensure the strength properties of the board, PM 1 includes the first OptiSizer Hard sizer in Türkiye. "We chose a hard nip sizer to achieve a stronger product. Compared with traditional sizers, with the same nip load and the same amount of size, you can have more strength in the end product," says Özşerbetçi. Investing in innovation was important for Kivanç Paper. "We could have chosen a film sizer, but if you want to do something better and remarkable, you need to take some risks and believe in new technology," Özşerbetçi continues.

COLLABORATION AT ITS BEST

Overall, the project has been successful, setting a high standard for other papermakers globally. "The line has been running well from the very beginning. We achieved 75 percent of the design speed very soon after the start-up, and we were able to produce sellable board within a few days," says Tekin. The success of the project comes in many ways from the extensive knowledge and experience of both Kivanç Paper's and Valmet's experts. Close cooperation between the companies has allowed innovation and product development during the project, which is very important with so many new technologies. "We are happy about the support we received during the project. If we needed to do something, or if we needed help during the running, we asked Valmet, and they immediately replied to us," says Özşerbetçi.

CONTACT

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Senior Paper Technology
Manager
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State-of-the-art from headbox to winder

Valmet's delivery for the board making line's stock preparation consists of an OCC line, stock preparation, and white water treatment, including a Valmet Drum Pulper, Conical Refiner Conflo units, Twister Hydrocyclone units, a saveall broke thickener, screening technology, and under-the-machine pulpers.

The Valmet-supplied board machine includes state-of-the-art technologies, from headbox to the reel and winder. The wet end of the machine includes an OptiFlo Layering Fourdrinier headbox with Aqua layering technology, an OptiFormer Hybrid forming section with shoe blade technology, and an OptiPress Linear press section. They are followed by an OptiRun compact dryer section. The finishing technologies of the machine consist of an OptiSizer Hard size press, an OptiCalender Hard calender, an OptiReel Linear reel, and a OptiWin Drum two-drum winder. A supply system for the sizer and air systems was also delivered by Valmet, including process ventilation systems featuring an OptiAir Hood high-humidity hood and OptiAir Recovery heat recovery.

The process technology is supported by digital services, automation systems, and other services such as paper machine clothing.

CLICK HERE
& WATCH
VIDEO





PM 1 has been running with Valmet's paper machine clothing, and the cooperation will continue through a fabrics agreement in the future.



Faruk Özşerbetçi, Paper Mill Director at Kivanç Paper, and Ari Hiltunen, Senior Paper Technology Manager at Valmet, inspecting the novel compact dryer concept.



TRANSFORMING TISSUE MILLS WITH *ELECTRIFY*



Claudio Ardrizzi
Energy Management
Expert, Tissue Production
Processes, Valmet

TRADITIONALLY, TISSUE PRODUCTION HAS RELIED HEAVILY ON THERMAL ENERGY FROM FOSSIL FUELS, ESPECIALLY IN DRYING PROCESSES. TODAY, MILLS CAN SHIFT TO ELECTRIFIED HEATING SOLUTIONS AND SIGNIFICANTLY REDUCE THEIR DIRECT CO₂ EMISSIONS.

ICATION

IN TISSUE MAKING, drying processes consume about 70 percent of the total energy, most of which is provided by fossil fuels. However, it is now possible to replace combustion-based heating processes with electric heating solutions. By integrating high-temperature heat pumps and replacing burners with electric heaters, mills can eliminate fossil fuel combustion from their drying sections, reducing their direct CO₂ emissions and energy consumption. For example, by adopting electric heaters in a Yankee Hood air system, mills can reduce energy consumption by up to 10 percent compared with systems using fossil fuel burners.

THE ADVANTAGES OF ELECTRIFICATION

"Electrifying processes in tissue mills is worthwhile because it directly supports customers' decarbonization, energy efficiency, and cost predictability targets," says **Claudio Ardrizzi**, Energy Management

Expert, Tissue Production Processes, Valmet. "Electrification also increases flexibility. As more countries expand renewable electricity generation, mills can increasingly operate on low-carbon power. This means customers are not only reducing emissions today but also future-proofing their operations against carbon pricing, regulatory pressure, and fossil fuel volatility. Electrification isn't just about replacing one energy source with another – it's about building a smarter, more controllable, and more sustainable production environment."

HELPING CUSTOMERS SAVE ENERGY

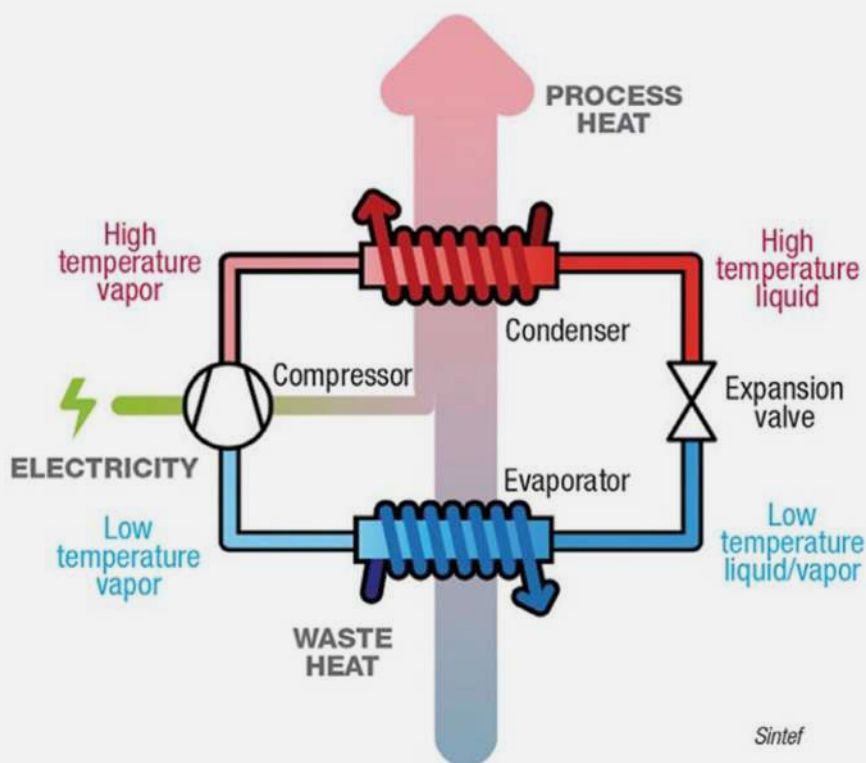
"My degree is in energy engineering, and I use a lot of my education in my work, consulting customers, mainly for the drying section," Ardrizzi says. "On a daily basis, I help customers understand where their energy is used, where losses occur, and what the improvement potential is. The first step is often to make the invisible,

visible – using data to reveal inefficiencies. For example, this involves mapping current energy consumption and identifying electrification opportunities. Once we have a clear picture, we can prioritize actions that bring both sustainability and financial benefits. We can also support customers with implementation and performance monitoring, and train their mill teams in energy optimization practices."

MILL-WIDE ENERGY EFFICIENCY EXPERTISE

Valmet supports customers with a mill-wide perspective, combining process technology expertise with deep knowledge of energy systems and automation. "We don't look at electrification as an isolated upgrade; we analyze the entire mill ecosystem – steam balance, heat recovery, drives, and automation," Ardrizzi explains. "This includes everything from energy audits and feasibility studies to mill-wide energy balance

"THE FIRST STEP IS OFTEN TO MAKE THE INVISIBLE, VISIBLE – USING DATA TO REVEAL INEFFICIENCIES."



Simplified scheme of a high-temperature heat pump.

"I HELP CUSTOMERS UNDERSTAND WHERE THEIR ENERGY IS USED, WHERE LOSSES OCCUR, AND WHAT THE IMPROVEMENT POTENTIAL IS."

simulations. We support customers with electrification roadmaps and the integration of electric boilers, heat pumps, and electric heaters."

"Because Valmet delivers tissue machines, automation, and services, we can optimize across process boundaries. This integrated approach is essential when transitioning to higher electrification levels. Electrification solutions such as electric heating, heat pumps, or hybrid energy systems must always be evaluated in the full tissue mill context."

ON THE ROAD TO FULLY ELECTRIFIED MILLS

The technology required to electrify heating processes has advanced rapidly in recent years, making it a realistic option for tissue mills. "One of the most important developments is the integration of high-efficiency heat pump technology into tissue mills," Ardrizzi says. "Modern industrial heat pumps can upgrade low-grade waste heat into useful process heat, significantly reducing demand for steam from fossil fuels. Another key trend is hybrid energy systems, where electric boilers, heat pumps, and traditional systems work together optimized by advanced automation. This allows mills to dynamically respond to electricity prices and

the availability of renewable power."

"Over the past few years, interest in electrified heating processes has accelerated significantly, and customers are being more proactive. Electrification is no longer theoretical. We're seeing real practical steps being taken toward fully electrified mills," he concludes.

CONTACT

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Electric heaters can be integrated into both new installations and rebuild projects.

**COMPACT, EFFICIENT, INNOVATIVE:
THE NEW ERA OF**

AIR ***DRYING***





WHEN ZHEJIANG FOREST UNITED PAPER BUILT THEIR NEW PM 6 PAPER MACHINE, VALMET SUPPLIED FOUR HEADBOXES, A TOP FORMING UNIT, FOUR COATERS, AND FOUR AIR DRYERS. ONE OF THE AIR DRYERS WAS AN OPTIDRY COAT DOUBLE-PASS, THE FIRST OF ITS KIND IN THE WORLD.

ZHEJIANG FOREST UNITED PAPER successfully started up its PM 6 board machine in Taizhou, Zhejiang, China, in February 2025. The company invested in a new machine to plug a gap in their production capacity. "Before the PM 6 start-up, we had already achieved a closed-loop industry chain across the upstream, midstream, and downstream packaging production – except for coated white lined chipboard. PM 6 plugs this capacity gap," says **Tong Lin**, General Manager of Zhejiang Forest United Paper.

PM 6 produces coated white lined chipboard grades, ranging from low basis weights (230–240 g/m²) to medium-high basis weights (340–390 g/m²). Product types include gray-back white lined chipboard, kraftliner, and coated kraftliner. The board machine features the world's first OptiDry Coat double-pass, which combines three advanced air-drying technologies in a single compact solution.

BRAND NEW AIR-DRYING TECHNOLOGY

PM 6 uses multiple OptiDry Coat coating air dryers to dry three top coating layers and one back layer, all of which are applied using OptiCoat Roll coating heads. Zhejiang Forest United Paper is pioneering the OptiDry Coat double-pass for drying the starch which is used on the back. Any initial concerns about adopting the new technology were quickly overcome, as the company has been very pleased with the results. They have found the biggest benefits include high drying efficiency and quality control, easier tail threading and operation, and a shorter machine length due to a short coating loop.

"The paper web runs through very smoothly, and drying performance is excellent. The narrow spacing significantly shortens the board machine's length, improves tail threading

efficiency, and reduces civil construction costs,” **Xiaobin Chen**, Deputy Production Director at Zhejiang Forest United Paper, confirms.

EXCELLENT QUALITY WITHOUT CURLING

The OptiDry Coat double-pass features three dryers in one. First, the high-intensity air dryer section quickly removes any free water. Next, the turning dryer section turns the web without contact at a lower temperature. Finally, the moisture control section stabilizes moisture and temperature at high air speed or heat.

The implementation of the OptiDry Coat double-pass system for back drying has directly addressed common challenges related to the curling of the board. “This system’s implementation has resulted in significant improvements in both curling and flatness, and customer feedback has been really positive,” Xiaobin Chen says.

WORRY-FREE OPERATION WITH AUTOMATION

Operators have found the Machine Control System (MCS) very user-friendly. It automatically adjusts the gap between the web and dryer based on coating and moisture changes. “It’s basically foolproof and very easy to use. The MCS takes care of everything automatically, making it worry-free,” **Leiming Shou**, Production Manager, Zhejiang Forest United Paper, says. “It automatically adjusts the positive and negative pressure to control the paper web and keeps the gap between the web and dryer consistent, which ensures the web stays very stable.”

OPTIFLO HEADBOXES ENSURE HIGH QUALITY

In addition to coating and drying technology, Zhejiang Forest United Paper has been especially happy with the four OptiFlo Fourdrinier headboxes Valmet supplied.

“Our surface smoothness currently reaches 300–400 s, and coated paper smoothness is controlled within 1.0 µm. We also ensure excellent printability. Whether it’s offset,



“THE MACHINE CONTROL SYSTEM TAKES CARE OF EVERYTHING AUTOMATICALLY, MAKING IT WORRY-FREE.”

rotary, or digital inkjet printing, our paper delivers consistently outstanding print results,” says Xiaobin Chen. “This achievement is underpinned by the key role Valmet’s headboxes play in sheet formation, allowing the base paper’s 2-sigma cross-direction basis weight to reach 0.36 g/m² in optimal conditions. This guarantees uniformity, a stable aspect ratio, and high consistency, ensuring print uniformity and laying a solid foundation for subsequent coating and printing processes.”

CLOSE AND TIMELY COOPERATION

Zhejiang Forest United Paper has been very happy with the cooperation with Valmet. “From supply to installation and commissioning, everything was timely, and any issue was resolved efficiently,” says **Changzheng Yang**, Project Manager at Zhejiang Forest United Paper. “I would rate our cooperation with Valmet a perfect 10! The service is prompt and considerate – they really stand in the customer’s shoes,” adds Tong Lin.



Leiming Shou, Production Manager of Zhejiang Forest United Paper, and Jibao Hui, Senior Product Sales Manager at Valmet, next to the new OptiDry Coat double-pass.



Xiaobin Chen, Deputy General Manager of Zhejiang Forest United Paper.



The OptiDry Coat double-pass air dryer features three dryers in one.



**CLICK HERE
& WATCH
VIDEO**



≡ Tong Lin, General Manager of Zhejiang Forest United Paper.



Arto Koski, Senior Paper Technology Manager at Valmet; Leiming Shou, Production Manager at Zhejiang Forest United Paper; Jibao Hui, Senior Product Sales Manager at Valmet; and Jinming Fan, PM 6 Production Supervisor at Zhejiang Forest United Paper.



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VALMET IQ VIRTUAL SENSOR IS A SOFTWARE-BASED SOLUTION THAT GIVES PAPER AND BOARD PRODUCERS REAL-TIME VISIBILITY OF CRITICAL END-PRODUCT STRENGTH PROPERTIES WHILE UNLOCKING SIGNIFICANT FIBER AND STARCH SAVINGS.

BOOSTING QUALITY WITH **VALMET IQ VIRTUAL**

VALMET IQ VIRTUAL SENSOR provides continuous quality predictions, enabling mills to maintain consistent quality, reduce fiber and starch costs, decrease energy consumption, and increase overall production efficiency.

By delivering minute-by-minute predictions of key paper properties, such as tensile and tear strength, burst and short-span compression test (SCT), using the mill's existing data, the system provides operators with real-time visibility into product quality. It continuously learns from laboratory feedback to enable proactive process optimization, reduce waste, help prevent quality deviations, and ultimately improve mill profitability.

"To avoid rejected batches, operators frequently build in large safety margins, resulting in increased use of costly raw materials and higher production costs. With Valmet IQ Virtual Sensor, operators no longer need to wait for laboratory results to understand how their actions will affect end-product quality," says **Timo Aro**, Business Manager, Quality Management System, Automation Solutions, Valmet. "In addition, its built-in 'what if' simulator lets operators test adjustments and see predicted impacts before applying changes to real

production. By reducing uncertainty and enabling lower safety margins, the solution demonstrates how optimized process control helps unlock resource efficiency."

ACTIONABLE INSIGHTS FROM INSTANT QUALITY PREDICTIONS

The system delivers real-time quality predictions during processing without the need for additional sensors or production downtime. It runs all calculations locally, without cloud dependency, ensuring secure data handling and fast response times.

The solution is highly intuitive and seamlessly integrated with Valmet DNA and Valmet DNAe, which allows operators to view predicted strength properties alongside other quality data from scanners. Empowered with these continuous insights, operators can make faster decisions and improve production efficiency.

ENHANCED OPTIMIZATION WITH INTEGRATED CONTROL

Valmet IQ Virtual Sensor is part of the Valmet IQ Quality Management Systems family, backed by more than



SENSOR

30 years of industry-leading expertise and continuous innovation in quality control for paper and board production.

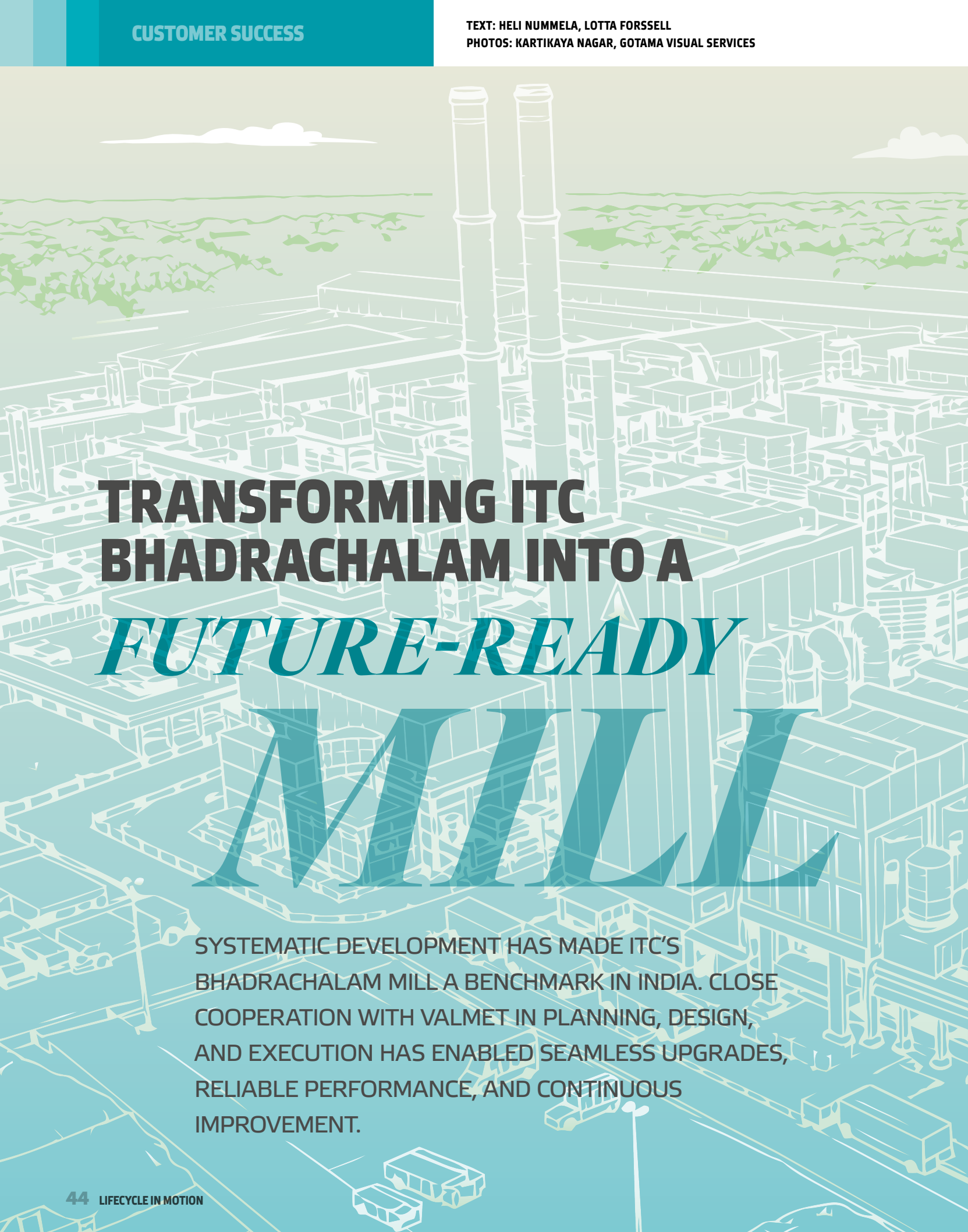
Although available as a standalone solution, Valmet IQ Virtual Sensor delivers unmatched quality management when combined with the Valmet IQ Quality Control System (QCS). Together, they provide mills with a holistic quality overview across the entire machine and even tighter control of essential quality parameters – all in one unified interface.

In addition, IQ Virtual Sensor is future-proof and can be expanded to automated closed-loop controls with Valmet Advanced Process Controls (APC), enabling the next level of quality performance, process optimization, and profitability.

CONTACT

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**“WITH VALMET IQ VIRTUAL SENSOR,
OPERATORS NO LONGER NEED TO
WAIT FOR LABORATORY RESULTS.”**



TRANSFORMING ITC BHADRACHALAM INTO A *FUTURE-READY*

MILL

SYSTEMATIC DEVELOPMENT HAS MADE ITC'S BHADRACHALAM MILL A BENCHMARK IN INDIA. CLOSE COOPERATION WITH VALMET IN PLANNING, DESIGN, AND EXECUTION HAS ENABLED SEAMLESS UPGRADES, RELIABLE PERFORMANCE, AND CONTINUOUS IMPROVEMENT.



SINCE ITS ESTABLISHMENT IN 1910, ITC has grown from humble beginnings into a diversified conglomerate with many business areas, including paperboards. The ITC Bhadrachalam mill is the jewel in the crown of their pulp and paper business.

"ITC is India's largest and greenest specialty paper and paperboard manufacturing company," says **A. Harinarayanan**, Vice President for projects at ITC Paperboards and Specialty Papers division. "We produce a wide range of graphic, fine, and packaging papers. Our manufacturing journey started way back in 1978, and we've since continued to augment our capacity. We've always been pioneers in adopting new technology."

BOOSTING PERFORMANCE WITH MAJOR UPGRADES

Over the past few years, Valmet has delivered several upgrade and modernization projects for the mill. These include new chipping lines, an additional batch cooking stage, upgrades to existing fiberlines, a new bleaching plant, a new high-power recovery boiler, a new ash leaching plant, extensive NCG collection and handling upgrades, and upgrades to three of the existing paper machines.

"ITC follows a triple bottom line performance approach - spanning, economic, environmental and social aspects to create sustainable value," explains A. Harinarayanan. "We've augmented our paper machine capacity significantly over the past three or four years. The pulp mill capacity has increased from 1,100 tonnes to 1,400 tonnes per day, which can supply the pulp requirement for the new paper machines."

TURNING MODERNIZATION INTO RESULTS

General Manager and Strategic Business Unit Head, **T. S. Bhaskara Rao**, is responsible for

**"WE HAVE
SELECTED STATE-
OF-THE-ART
TECHNOLOGY FOR
OUR MILL."**

all the pulp production at the ITC Bhadrachalam mill. He has overseen the recent Valmet deliveries. "We've selected state-of-the-art technology for our mill," he says. "The new recovery boiler has brought a lot of added value to the business in energy efficiency, specific consumption, and steam generation. The newly commissioned fifth chipping line is running at full capacity with high chip quality, and the additional digester helps us improve our overall production capacity and productivity. The experiences so far are promising, and stable quality has been achieved. We've had a longer journey with the fiberline, but we're now at the point of meeting our targets," T. S. Bhaskara Rao says.

GOOD DAY-TO-DAY COOPERATION

The cooperation between ITC and Valmet includes performance agreements and expert services that provide vital day-to-day support to secure reliable production and high performance.

"I've been cooperating with Valmet for the past 25 years – from paper machines to pulp mill and recovery," T. S. Bhaskara Rao says. "We thoroughly enjoy working with Valmet because of their commitment to technological advances and efficiencies and safety. If we have any issues or technical challenges, we can reach out to Valmet and get timely support to minimize any production or efficiency losses."

ENHANCING CHIP QUALITY AND CAPACITY

Over the years, ITC has upgraded its wood handling to improve chip quality, which is critical for efficient cooking. The mill now operates five chipping lines, and a sixth is scheduled to start up in 2027.

"All the chipping lines are performing well," says **K. Sripathi**, Chief Manager, Pulp Mill at ITC Bhadrachalam. "We process multiple raw materials, different wood species of varying sizes, which is a major challenge. Valmet Disc Chippers and Chip Screens have successfully handled this variability, consistently delivering uniform high-quality chips. We're now achieving an 88–90 percent share of acceptable chips,



A. Harinarayanan, Vice President for projects.



T. S. Bhaskara Rao, General Manager and Strategic Business Unit Head, at the ITC Bhadrachalam mill.



K. Sripathi, Chief Manager, Pulp Mill.



ITC Bhadrachalam pulp and paper mill continues to set new benchmarks through long-term modernization and close collaboration with Valmet.

High-performing chipping lines produce stable chip quality from diverse wood species, ensuring efficient cooking and supporting the mill's expanding capacity.



**"WE'RE NOW
ACHIEVING AN
88-90 PERCENT
SHARE OF
ACCEPTABLE
CHIPS, WHICH HAS
IMPROVED
OUR COOKING
EFFICIENCY."**



The upgraded fiberline is reaching its operational targets.



Project team at ITC Paperboards and Specialty Papers Division's new headquarters in Hyderabad.



N. V. Mohan Rao, Head of Soda Recovery Boiler.



M. Satyanarayana, Deputy General Manager for Projects.



which has improved our cooking efficiency. With the sixth Valmet chipping line, we'll secure sufficient inventory to run the mill at full capacity," he adds.

FIRST HIGH-POWER RECOVERY BOILER IN INDIA

ITC has significantly improved the reliability and efficiency of its chemical recovery and power generation with India's first state-of-the-art high-power recovery boiler, along with a new ash leaching plant.

"One modern Valmet Recovery Boiler replaced three older ones, delivering higher efficiency and stable operation. As a result, we increased our renewable energy share from 43 to 53 percent, and we're saving about

160,000 tonnes of coal annually," says A. Harinarayanan.

"After the commissioning of the high-power recovery boiler and the installation of the ash leaching plant, we've run comfortably for more than 18 months with smooth and uninterrupted boiler operation," says **N. V. Mohan Rao**, Head of Soda Recovery Boiler, at ITC Bhadrachalam.

A MILL-WIDE NCG SYSTEM

In addition to production capacity upgrades, the mill has implemented a mill-wide system to collect and handle toxic and flammable non-condensable gases (NCG).

"Our main objective was to make the workplace safe and environmentally friendly by

collecting all the NCGs across the pulping and recovery plants. We conducted a comprehensive study with Valmet, identifying nearly 180 sources that needed to be connected to our mill without disturbing operations. And we did it! We successfully planned, executed, and commissioned everything together," says **M. Satyanarayana**, Deputy General Manager for Projects at ITC Bhadrachalam.

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**CLICK HERE
& WATCH
VIDEO**



The high-power recovery boiler ensures stable operation and improved energy efficiency.



“ONE MODERN VALMET RECOVERY BOILER REPLACED THREE OLDER ONES, DELIVERING HIGHER EFFICIENCY AND STABLE OPERATION.”



Valmet expert support secures reliable production and high performance.



Bogdan Pavlovic
Business Manager Board
and Paper Analyzers,
Automation Systems

4 WAYS

to transform your stock preparation and wet end

With real-time measurements in stock preparation and the wet end, combined with advanced process controls, you can minimize the process variability that drives unnecessary energy and material consumption, while consistently maintaining production quality and runnability targets.

1

CUT OPERATING COSTS

Did you know that by stabilizing key process conditions, you can reduce your mill's consumption of energy, chemicals, and fresh water? For example, Valmet automatic refining controls can decrease your refining energy demand and optimize the pulp ratio to reduce press section dryness and drying energy costs. Accurate measurements also enable you to follow processes in real time and ensure that chemicals are dosed exactly as required, stabilizing white water quality. With our measurement solutions, you can also minimize fresh water consumption by measuring and optimizing disc filter performance for sweetener stock and polymer addition.

2

GET MORE VALUE FROM EVERY FIBER

With Valmet's online measurements and optimized stock preparation, you can reduce reliance on expensive fiber components while maintaining your targeted sheet properties. This lets you optimize your yield, improve sheet quality, and reduce broke. It also means faster grade changes, fewer process delays, and less waste. With more stable production, you get improved availability, predictable performance, and maximum return from your raw materials.

3

RUN FASTER, LONGER, AND MORE RELIABLY

When you stabilize your wet end chemistry and retention, you can minimize stickies, deposits, and chemistry-related disturbances – a stable wet end is a profitable wet end. Valmet's automation lets you achieve this with advanced charge and retention control to ensure stable dewatering and fines management. This reduces web breaks and unplanned shutdowns while enabling higher machine speeds, giving you improved runnability and fewer interruptions for a higher production output.

4

TURN PROCESS CONTROL INTO MEASURABLE PROFIT

When you can measure and control the whole process in real time, you can turn local optimization into mill-wide gains. Valmet connects stock preparation, wet end, and quality control in a unified mill-wide optimization concept. This enables mills to reduce quality variability and boost process performance, delivering more value across the production chain. With Valmet's Mill-Wide Optimization, you can achieve cost savings that go well beyond improvements in isolated subprocesses.

In practice, mills can see up to €2 million in annual savings from reduced quality variation.

Measure
key process
parameters

**ANALYZERS &
MEASUREMENTS**

Learn about
your process

**QUALITY CONTROL
SYSTEMS**

Stabilize your
process with
controls

**ADVANCED PROCESS
CONTROLS**

Optimize
sub-processes
manually or with
APCs

Optimize your
entire mill with
Valmet's **Mill Wide
Optimization**

**MILL WIDE
OPTIMIZATION**

Continuous real-time measurements reveal where a process is underperforming. Turn your data into comprehensive actions for better operational efficiency and sustainability.

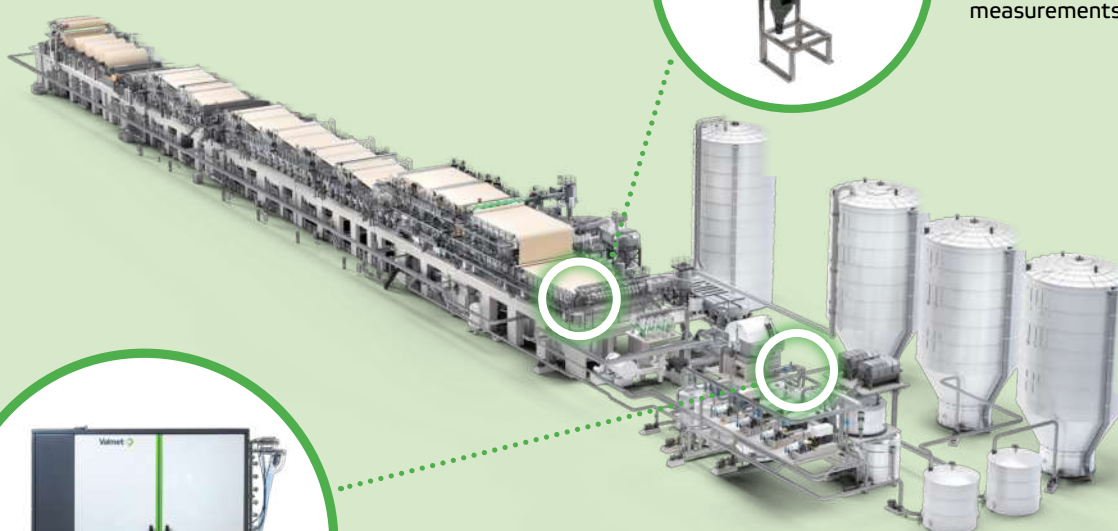
Potential savings with Valmet real-time measurement solutions and process controls

- + Up to 12% reduction in refining energy
- + 4% lower total energy use with +1% press dryness
- + Reduced chemical and fresh water consumption.

Potential benefits of optimizing wet end chemistry and retention with Valmet automation

- + Up to 30% fewer web breaks
- + 42–60% less headbox charge variation
- + Up to 41% reduction in lost production with retention control.

A good starting point with measurement and analysis is to implement Valmet Retention Measurement (Valmet RM5) and Valmet Wet End Analyzer (Valmet WEM) in your production line.



Valmet Retention Measurement

Retention measurements

Valmet Wet End Analyzer

Process chemistry, charge, and turbidity measurements

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UPGRADING TO PEAK

WITH A SYSTEM-WIDE OPTIMIZATION APPROACH, LEE & MAN TRANSFORMED THEIR TWO TISSUE LINES TO PEAK PERFORMANCE — UNLOCKING HIGHER SPEEDS, IMPROVING QUALITY, AND ACHIEVING MEASURABLE GAINS ACROSS THE ENTIRE PRODUCTION PROCESS.



WITH 12 TISSUE LINES operating around the clock and an annual capacity of 540,000 tonnes, the mill continues to set industry benchmarks in China. However, two of its machines – TM 1 and TM 2 – faced challenges. Cross-direction moisture variation, high energy consumption, and speed limitations were affecting productivity and product quality. Carrying out the necessary upgrades within the limited downtime became a joint challenge for Lee & Man and Valmet.

SYSTEM-WIDE OPTIMIZATION

To address the issues, Lee & Man turned to Valmet for a comprehensive solution. According to **Wei Chong**, Production Director, Lee & Man, previous attempts from various suppliers had offered only partial solutions. Valmet's approach stood out by focusing on system-wide optimization rather than isolated adjustments.

However, the retrofit project was highly challenging. There was virtually no precedent for such upgrades to the installed tissue machines. A cross-disciplinary Valmet team, including specialists in the forming, pressing,

PERFORMANCE



and drying sections, conducted multiple onsite studies, analyzed historical performance data, and identified the true root causes of moisture variation and speed limitations.

CROSS-DEPARTMENT COOPERATION

The upgrade demanded close cooperation across timezones, departments, and expertise areas. Lee & Man's production leaders highlighted Valmet's responsiveness, technical depth, and coordinated teamwork as essential for the project's success.

"Valmet's cross-department expert team collaborated closely for a common goal, ultimately achieving the

expected results," says **Wei Chong**, Production Director, Lee & Man. "In my 20 years of experience, this was the best team performance I've seen. Their actions perfectly exemplified a customer-centric culture and the philosophy of partnership – not just supplying equipment, but delivering holistic solutions and value-added services."

A CLOSE LOOK AT THE WHOLE PICTURE

The project focused on three key pillars. First, the problem areas had to be accurately identified. This involved multiple site surveys, an analysis of the historical data, and an examination of the equipment records to pinpoint the key factors affecting moisture variation. The next step

Chongqing Lee & Man mill, with 12 production lines running around the clock and an annual capacity of 540,000 tonnes.

was comprehensive process optimization. This included everything from headbox alignment and press roll/Yankee crown calculations to press section adjustments, Yankee curve tuning, and hot-air system checks, with each step carefully calculated and optimized. Finally, the team provided timely follow-up adjustments. Having completed the upgrades and optimization, they combined theoretical calculations with real-time operating data to quickly correct deviations, ensuring that the solutions aligned with production reality.

"In this project, both sides worked seamlessly together, overcoming short downtime and cross-department communication challenges, and ultimately achieving outstanding retrofit results," says **Peng Biao**, Deputy Production Manager, Lee & Man. "I give Valmet's service top marks!"

THE DATA TELLS THE STORY

After the upgrade, TM 1 and TM 2 delivered remarkable and measurable improvements, with a 7 to 8 percent increase in operating speed, enabling the machines to reach their design speed of 1,000 m/min. As hoped, the moisture variation issues were substantially improved, leading to a uniform moisture profile. Steam consumption was reduced by ≈ 0.2 tonnes, and felt life was extended by more than 10 days. In addition, the pressure of the press section rolls could be increased, and capacity and efficiency also improved.

"After the retrofit, cross-direction moisture improved significantly, machine speed reached design value, capacity increased, energy consumption decreased, and quality became more stable. We're very satisfied with Valmet's professionalism, and we look forward to further cooperation," says **Guo Tao**, Senior Production Manager, Lee & Man.

LOOKING AHEAD

With its proactive mindset, Lee & Man continues to pursue innovative technological upgrades to enhance efficiency and productivity, improve quality, and reduce energy consumption. Valmet will remain a strategic partner, supporting the mill with advanced technology, services over the machine's lifecycle, and continuous process development.

Together, the two companies are shaping a more efficient, innovative, and environmentally responsible future for the tissue industry.

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**"THE UPGRADES
DELIVERED
MEASURABLE
IMPROVEMENTS ON
BOTH LINES, WITH A 7 TO
8 PERCENT INCREASE IN
OPERATING SPEED."**

TM 1 and TM 2 faced issues which directly affected sheet thickness and product quality.



A cross-disciplinary team planned and executed the optimization plan. (Top to bottom) Rocky Li, Account Manager, Valmet Tissue Service APAC; Guo Tao, Senior Production Manager, Chongqing Lee & Man; Zhang Huaming, Technology Manager, Valmet Tissue Service, Tissue Machine Services, and Spare Parts.



"I give Valmet's service top marks," says Peng Biao, Deputy Production Manager, Chongqing Lee & Man.



"IN MY 20 YEARS OF EXPERIENCE, THIS WAS THE BEST TEAM PERFORMANCE I'VE SEEN."





FINALLY,
CORELESS IS

EASY

VALMET PERINI ECORE IS A RETROFIT-READY SYSTEM DESIGNED TO INTEGRATE SEAMLESSLY INTO EXISTING PRODUCTION LINES, ENSURING SMOOTH OPERATIONS AND FAST INTERVENTIONS WITHOUT THE NEED FOR COMPLEX STRUCTURAL CHANGES.

AN EVOLUTION of the well-established Perini mandrel system, successfully implemented for more than 20 years in Away-from-Home (AFH) lines, Valmet Perini ECOre has been redesigned and optimized to meet the specific needs of the consumer segment, delivering high performance in terms of logs per minute and finished product quality.

The technology offers clients a clear advantage: A non-invasive upgrade which enables the production of both coreless and cored tissue paper rolls, while reducing cardboard use, improving efficiency, and simplifying process management.

"Perini ECOre is a solution that enhances the value of both existing and new lines," says **Fabrizio Lorenzi**,

choose the most suitable line layout based on their installed base, market, and plant conditions."

EASY INTEGRATION INTO EXISTING LINES

One of Valmet Perini ECOre's distinctive features is its retrofit-friendly architecture, which allows integration into existing lines without major changes to the production layout. The key element is the mandrel extraction system, positioned above the log loader. This solution ensures easy access to the unit while maintaining the line's original length. Four extraction stations work simultaneously, guaranteeing constant high-speed production. On each side, a dedicated

parameters are essential to ensure that coreless rolls maintain their integrity throughout the value chain, from winding to cutting, packaging, palletizing, transportation, and distribution in retail.

From a sustainability perspective, removing the cardboard core significantly reduces material and adhesive use, bringing measurable benefits, both environmentally and economically. In addition, Perini ECOre offers great flexibility: The system can quickly switch between producing cored and coreless rolls. This adaptability gives clients a competitive edge, enabling them to respond quickly to shifts in demand, while maximizing return on investment.

TO PLAY

Development Converting Manager at Valmet. "This innovation reflects Valmet's vision in the development of technologies that not only meet today's market needs but also anticipate future trends. This ensures a strong commercial impact and offers our clients flexibility in their investments, allowing them to

transportation system moves the mandrels from the extraction area to the rewinder, keeping the process efficient and steady.

In terms of performance, Perini ECOre has a production capacity of 20 logs per minute and aligns with industry requirements for roll length, density, and quality. These

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**"PERINI ECOre IS A SOLUTION
THAT ENHANCES THE VALUE
OF BOTH EXISTING AND
NEW LINES."**

FROM VISION TO VICTORY UNMATCHED PERFORMANCE WITH *SLEEVE ROLL TECHNOLOGY*

THE GAME CHANGING RESULTS FROM THE WORLD'S FIRST SLEEVE ROLL ON THEIR BM 3 ENCOURAGED AJIN P&P CO., LTD. TO REPEAT THE ORDER OF A FORMING SECTION REBUILD FOR THEIR BM 2.

"THE MOTIVATION FOR our investment is the desire to achieve superior product quality, especially formation and internal bonding strength. The key is delivering consistent, high-quality paper that meets customer expectations of stability and runnability in their converting processes. This customer satisfaction is the foundation of Ajin's competitive power and long-term success," **Dr. Jin-Doo Kim**, CEO, Ajin, explains. "The adoption of Sleeve roll technology was a bold move that allowed us to leap ahead of our competitors, rather than merely trying to catch up with them using the same methods and principles that have been in place for decades and longer."

ADVANCING SUSTAINABILITY

As a leading Korean corrugated board and packaging manufacturer, Ajin has played a leading role in the industry for more than 45 years. Sustainability is of the utmost importance for Ajin, and they aim to be the recyclability leader in the paper industry. Dr. Kim sees it as imperative for the industry to develop high-quality, functional, and more easily recyclable papers as alternatives to plastics.

BM 2 produces test liner grades in the 115 to 250 g/m² basis weight range from Korean OCC (Old Corrugated Container). The multifourdrier forming section was upgraded with a Sleeve roll in the combining position in September 2024.

SLEEVE ROLL TECHNOLOGY: A GENIUS GAMECHANGER

Sleeve roll technology is a major breakthrough in forming section technologies. It replaces traditional vacuums and suction boxes with a genius new principle, in which the web is compressed between two forming fabrics against a small radius shoe, creating very high dewatering pressure. With the basic circle before the shoe of the Sleeve roll, the fabric tension creates moderate pressure. When passing over the variable radius shoe, the dewatering pressure increases steadily toward the maximum compressing pressure of up to 150 kPa.



**"SLEEVE ROLL TECHNOLOGY
ENHANCES DEWATERING
CAPACITY, BOOSTS EFFICIENCY
AT HIGH SPEEDS, AND IMPROVES
INTERNAL BONDING."**



The Ajin and Valmet teams celebrating BM 2's excellent performance with its Sleeve roll technology.



Dr. Jin-Doo Kim, CEO, Ajin, describes the Sleeve roll as a genius technology.



Ajin P&P has made strategic investments in their Hyunpoong Mill to achieve superior product quality, consistent high-quality paper, and high customer satisfaction.

"THE SLEEVE ROLL HAS LED TO A SIGNIFICANT COMPETITIVE ADVANTAGE FOR US, WITH DRAMATIC IMPROVEMENTS IN PAPER QUALITY."

The steadily increasing dewatering pressure in the Sleeve roll shoe causes no defects to the web, even with very low ingoing consistency. This gentle yet effective approach harnesses fabric tension and shoe interaction to gradually increase the dewatering pressure, resulting in efficient water removal without compromising paper integrity.

A BIG IMPROVEMENT IN THE FORMING SECTION

"Sleeve roll technology fundamentally changes the forming section," says Dr. Kim. "We've seen higher dewatering capacity, improved efficiency at higher speeds, and better performance with lower basis weights. There's also been a massive improvement in the internal bond, as Ajin samples now have an internal bond that is up to 52 percent better than market samples. It's proven durable and requires minimal maintenance."

Sleeve roll technology is installed on both of Ajin's board machines. BM 3 is the world's first Sleeve roll in a hybrid former. Globally, BM 2 is the third installation in a combining position on a multifoldriner former. "There have been no issues or problems with

either of the Sleeve rolls," says Dr. Kim. "Their operation is extremely stable. BM 3 has been running for more than four years without any major maintenance. The Valmet Sleeve Roll Belt's lifetime is also currently more than a year, which is very satisfactory. The same goes for the forming fabric's lifetime."

A SIGNIFICANT COMPETITIVE ADVANTAGE

"The Sleeve roll has resulted in a significant competitive advantage for us. Dramatic improvements in paper quality, especially in formation and the internal bond, are the most important gains. BM 2's internal bonding strength is nearly 300 J/m², whereas that of market samples is below 200 J/m². We have excellent machine direction (MD) and cross-direction (CD) stability, and consistent quality. Steam consumption has reduced by up to 8 percent, with energy consumption maintained or reduced, while there's been a notable increase in machine speed. Time efficiency has increased, grade changes are faster, and there have been 62 percent fewer sheet breaks," Dr. Kim lists.

LONG-TERM PARTNERSHIP AND CO-CREATION

Dr. Kim highlights the long-standing collaboration with Valmet, describing it as a true co-creation, where both parties have contributed ideas and innovations for decades. He emphasizes the open communication, mutual learning, and support between the teams, with a strong culture of knowledge sharing. This partnership has led to the development and commercialization of several innovative technologies, including the Sleeve roll.

"I'm a lucky guy to have met and partnered with a company like Valmet," Dr. Kim concludes.

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Tissue 50+

For over five decades, Valmet has been delivering tissue technology to the world. These numbers highlight our milestones, innovations, and passion for tissue making.

1000+ Pilot trials

Powered by people with a love for innovation the Tissue Technology Center has been instrumental in the success of experimenting with product quality and launching new technology.

130+ DCT machines delivered.
Enough tissue for

40,750
circles around
the globe!



Since 2005 a DCT machine has decreased water consumption by around 60% which equals

10,366
olympic swimming pools

250+ tissue machines installed.
Enough tissue to blow your nose

3.7 trillion times
(yes, we did the math).

700+ Yankee dryers
have been delivered since 1860 to paper
and tissue producers around the world.

120 km/h

That's how fast a tissue machine can run.
In fact, a Valmet Advantage DCT machine
is currently holding the Guinness World Record



Delivered tissue technology to

40+ countries

With that speed, the time
from pulp to finished paper is

1.5 seconds

Energy consumption on a DCT production line
has decreased by 40% since 2005 —
equivalent to charging the battery of an electric car

105 million times

Improved uniformity, product quality
and lower energy consumption with
Advantage™ ViscoNip® presses

100+

165
years of knowledge
in papermaking



With the Valmet Hybrid concepts

420 trees/day

can be saved compared to a
conventional process



Maximizing plant RELIABILITY with digital valve monitoring

AS PART OF THEIR MODERNIZATION JOURNEY, MERCER STENDAL HAS ADOPTED VALVE PERFORMANCE MONITORING (VPM) FOR THEIR MOST CRITICAL 500 VALVES TO SHIFT FROM REACTIVE TO PROACTIVE VALVE MAINTENANCE.

VPM IS A DIGITAL service designed and built to detect valves which have some degradation in their performance, provide expert recommendations, and offer service support to solve potential malfunctions.

Recently, a VPM service agreement was signed with Mercer Stendal's pulp mill in Germany. The five-year Valve Performance Monitoring (VPM) agreement covers the monitoring of the most critical 500 valves, 24/7 online valve monitoring, and the delivery of four

expert diagnostics reports per year. The diagnostic findings are followed with interactive tickets in the Work Flow Hub platform to ensure every issue is treated and solved. All the information like dashboards and reports is available and updated in the customer's cloud collaboration space, Valmet Customer Portal.

LONG-TERM PARTNERSHIP

Mercer's pulp mill in Arneburg uses Valmet's technologies extensively, from automation to flow control solutions. Mercer Stendal is running

the plant with the Valmet DNA automation system, and they have an installed base of 1,000 Neles™ valves. This new agreement is a continuation of the modernization of their plant.

"We've had a long relationship with Mercer Stendal. They rely on our products, and the previous Neles™ NDX™ replacement project was very successful, proving that we're a reliable and sustainable partner to work with. Now, they want to utilize the data coming out of their valve positioners better. Valmet is doing the online 24/7 valve monitoring and interacting continuously with the customer. Every three months, we combine the findings in a diagnostics report. The findings and expert-recommended actions are then discussed with the customer until a conclusion is reached. To enhance resource efficiency, the VPM service ensures a more targeted approach to maintenance, while outsourcing the monitoring and analysis tasks," says **Christian Beig**, Sales Manager, Valmet Flow control business.

The service also helps identify the exact valves that will need to be serviced during the next shutdown.

“A PROACTIVE MAINTENANCE APPROACH UTILIZING VALVE DATA AND DIAGNOSTICS CAN SAVE CUSTOMERS A LOT OF TIME AND MONEY.”

PROACTIVE MAINTENANCE ENSURES RELIABILITY

The main objective for Mercer Stendal is to switch from a reactive to a proactive valve maintenance mode. By taking a reliable and proactive approach and predicting progressive failures, both plant uptime and valve availability are increased. With Valmet's VPM service, Mercer Stendal will receive continuous expert service recommendations for valves, actuators, and positioners, with the right service support to solve all the identified issues. The service also helps find the exact valves that need to be serviced during the next shutdown. And it can focus only on the critical valves, saving time and money.

“Over the past six months, we've worked with the customer on exploring the findings of what occurred after implementing the service recommendations. We've seen this leading to a positive impact on plant production and improved product quality. In addition, the service enables better

process optimization, as the valves' fine-tuning and stabilization lead to energy savings. There's also a growing global trend to move toward digitalization within the process industry. A proactive maintenance approach and utilization of valve data and diagnostics can save a lot of the customer's valuable time and money. Our expert service helps them move forward on their digitalization journey. I'm happy to see that our customers value our knowledge and capabilities of offering such services,” says

Boris Volavicius, Digitalization Sales Director, MRO and Services business unit, Flow Control, Valmet.

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Valmet's ValvesNow

provides automatic, cloud-based valve performance analysis via the Valmet Customer Portal. It collects daily diagnostics from Neles™ digital valve controllers and delivers weekly fleet-level insights. ValvesNow prioritizes valve issues, identifies poorly performing devices, highlights alarms, and supports proactive maintenance with full fleet visibility to optimize maintenance planning and resources.

Success is built by

PEO

AFTER OVER A DECADE OF OPERATION AND A SIGNIFICANT PRODUCTION CAPACITY INCREASE, THE RECOVERY BOILER HAS BEEN RUNNING LONG CAMPAIGN CYCLES, WITH NO UNPLANNED STOPS. THE KEY TO SUCCESS IS THE COMBINATION OF EMPOWERED PEOPLE AND ADVANCED OPTIMIZATION TOOLS.

PLE

at the Eldorado mill





With the aid of optimization and preventive maintenance, the recovery boiler can run for 18 months, with no unplanned shutdowns.

The Eldorado pulp mill in Tres Lagoas, Mato Grosso do Sul, Brazil, started up officially on December 12, 2012 at 12:12 p.m. The mill has been performing exceptionally well over the past decade and has been able to increase its production from 1.5 million tonnes per year to 1.8 million tonnes. With such a significant incremental capacity increase, it's natural that the recovery area, and especially the recovery boiler, has become a bottleneck.

To dive more deeply into how the recovery boiler has been able to meet this challenge, we spoke to **Rafael Siqueira**, Process Specialist in the Recovery Area at the Eldorado mill, who is responsible especially for the recovery boiler and evaporation operations. "We're running the boiler at above 99 percent efficiency. Meeting the increased capacity demand is a question of both reliability and performance, and a lot about optimization. But if we're going to optimize, we first need to standardize."

IT'S ALL ABOUT PEOPLE

The discussion very quickly turns to people, and how we can enable them to perform at their best. "Technology and equipment have evolved a lot, but it all depends on each one of us," he says. "At Eldorado, we strongly believe in people's potential and knowledge. The knowledge we acquire in daily operations is crucial."

EVERYONE WORKING FOR THE SAME GOAL

Respecting people is truly in Eldorado's DNA. "Eldorado has

a culture of making everyone feel they are part of the result. We're all part of the process. Everyone, from the board of directors to the factory floor, shares the same goal." There is a particular attention to detail and there are several garden areas inside the mill gates. "We believe that a well organized and pleasant environment supports us in getting good results."

The mill has more than 5,000 employees. Unlike many mills, 98 percent of the people are Eldorado's own employees, including canteen staff, janitors, and cleaners. Many

"VALMET'S DIGITAL SERVICES, LIKE APCs, CONTRIBUTE A LOT TO PRODUCTION STABILIZATION."



of the people working at the mill, including Rafael Siqueira, have been working at the mill since the project phase.

“For example, we didn’t hire DCS operators after the project, but the people working on the project – myself included – moved to operations. Whenever new positions open, we seek candidates internally. We really believe in people, and I think this is fundamental to our success.”

The Eldorado mill prides itself on being one of the most beautiful mills in the world.

Valmet’s resident APC Service Engineer Nayelen Aizawa (on the left) plays an important role at the mill, supporting data analysis and Eldorado’s operational decisions.

ON ONE TEAM WITH VALMET

Nayelen Aizawa works at the mill as a resident Valmet APC Service Engineer. Her task is to support the mill in using the various digital solutions Valmet delivers to the mill. “It’s very clear that everybody – from both Valmet and Eldorado – is committed to the mill’s performance,” she says. “My task is to follow our APC tools and performance monitoring dashboard and take the findings to the daily meetings. I really enjoy working here – the atmosphere is very positive and respectful. When I started here, everyone was very patient with me and taught me and helped me to understand the process.”

“I see Nayelen as almost an employee of Eldorado. She plays an important role in sitting down with our people, accessing the information, giving her opinion, and

helping everyone understand the data,” Siqueira adds.

DIGITAL SOLUTIONS SUPPORT PEOPLE

The key to managing the recovery boiler performance is stability and the avoidance of unplanned disturbances. “Valmet’s digital services like Advanced Process Controls (APCs) contribute a lot to production stabilization. I believe this is the most monitored boiler in the world.” The team emphasizes timely and predictive maintenance, as well as regular soot blowing. “We have to be assertive and quick to identify problems to avoid any negative impacts on boiler performance. I believe the integration of people with technology is the future,” Siqueira says.

SUCCESS IS SHOWN IN NUMBERS

It has been possible to increase boiler capacity by more than 20 percent from the original design capacity by optimizing boiler operation, preventive maintenance, and small upgrades. Additionally, the campaign cycle has increased. “Today we can run the boiler for 18 months without any cleaning intervention. Even after 18 months, the boiler is still clean, and our shutdowns are also shorter than average,” Siqueira notes.

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Valmet delivery to the Eldorado mill

- Evaporation plant
- Recovery boiler
- Recovery boiler optimization solution (APC)
- Analyzers for recovery line, fiberline, drying machine and laboratory
- Service agreement for on-site and remote expert support

Sofidel has relied on Valmet IQ solutions for more than 30 years.

A man wearing a blue KASK helmet and a yellow safety vest stands in a factory setting. He is looking slightly to the right. The background shows industrial equipment and a large hall.

30 YEARS TOGETHER

– SOFIDEL'S JOURNEY WITH
VALMET IQ QUALITY CONTROL



FROM THE FIRST PAPER MACHINE IN PORCARI TO THE LATEST SPECTRUM MEASUREMENT SOLUTION, SOFIDEL AND VALMET HAVE BUILT A LASTING PARTNERSHIP, ROOTED IN RELIABILITY, CONTINUOUS INNOVATION, AND COMMITMENT TO SUSTAINABILITY.

FOUNDED IN ITALY IN 1966, today Sofidel is one of the world's largest producers of paper for hygienic and domestic use. The group has continuously invested in advanced technologies to improve its efficiency, quality, and sustainability. Producing more than 1.8 million tonnes of paper annually across 21 sites in Europe and the United States, Sofidel focuses on delivering high-quality products while reducing its environmental impact.

For more than three decades, Valmet IQ Quality Control Systems (QCS) have supported Sofidel in its growth and drive for operational excellence.

MORE THAN 20 QCS INSTALLATIONS OPERATING TODAY

Sofidel's cooperation with Valmet started in 1994 with the PM 3 tissue machine in Lucca, Italy. It was the Sofidel's first wide tissue machine – and the first Valmet

machine at Sofidel. Many others would follow.

Valmet's automation solutions, including QCS technology, were introduced soon after that first installation.

"That's when I joined the company," recalls **Fabrizio Lapucci**, Corporate Automation Manager at Sofidel. "The group needed someone to oversee the installation of



Sofidel's mill in Porcari, Italy.

"VALMET'S QCS IS A VERY USER-FRIENDLY SYSTEM. IT'S ENGINEERED WELL AND IS VERY EASY TO INSTALL."

all the new technologies, which were quite extensive in the field of automation.”

Over the years, Sofidel has continued to adopt Valmet IQ solutions. It now has more than 20 QCS installations at mills across the world.

“I would say that Valmet’s QCS is a very user-friendly system – it’s engineered well and is very easy to install. What’s been especially important for us is that it integrates seamlessly with the mill’s Valmet DNA Distributed Control System (DCS),” says Lapucci.

PHASING OUT RADIATIVE-SOURCE SCANNERS

In the early 2010s, Sofidel shifted from radiative-source sensors to infrared technology.

“When Valmet developed this technology, we decided to replace all the radiative-source scanners in our mills with the new infrared-based IQ solution,” Lapucci says.

“This was a game changer. With infrared, we eliminated the challenges of radiative sources – heavy documentation, permits, and, of course, safety concerns. At the same time, we gained more efficient and reliable measurements. This helped us significantly optimize machine performance. And because the main source is a thermal lamp, it’s also inexpensive and easy to maintain. After the first installation, we went on to implement the infrared scanner at almost every Sofidel mill,” he adds.

NEXT-GENERATION MEASUREMENT

Innovation remains key to the partnership. Over the past two years, Sofidel has worked closely with Valmet to develop and test the new IQ Spectrum Measurement.

“This sensor is very important for us,” Lapucci says. “As the latest innovation for the tissue industry, it offers a next-generation solution for measuring special papers, delivering reliable results under all conditions and for all fiber types. That’s

Sofidel replaced all the radiative-source scanners at their mills with Valmet’s infrared-based IQ solutions.

especially valuable, as tissue compositions and treatment methods are continuously evolving and are always posing new challenges.”

“We’re now installing the first units in Sweden and the US, and we see a lot of potential,” he adds.

GREATER EFFICIENCY BRINGS GREATER SUSTAINABILITY

For Sofidel, sustainability has always been a core value. By enabling tighter control of fiber, energy, and water consumption, Valmet IQ helps Sofidel achieve measurable efficiency and a resulting increase in sustainability across its mills.

**“WITH VALMET IQ INFRARED SOLUTIONS,
WE GAINED MORE EFFICIENT
AND RELIABLE MEASUREMENTS.”**



Fabrizio Lapucci,
Corporate Automation
Manager at Sofidel.



The Valmet QCS is integrated seamlessly with the mill's Valmet DNA Distributed Control System (DCS).

The QCS is the focus. It is from here that all the machine and paper parameters are collected. “Connecting all the data in one place allows us to optimize performance and significantly reduce consumption – whether it’s water, electricity, or gas,” Lapucci explains.

“With more precise moisture control, we can reduce energy use. And by using accurate machine settings, we can save considerable amounts of fiber. The impact over the years has been substantial,” he says.

MORE THAN TECHNOLOGY

While the relationship between Sofidel and Valmet has been built on their shared focus on innovative technology, deep personal connections have also developed. Lapucci himself has been a key link between the two companies for more than 30 years, collaborating closely with Valmet’s teams in Tampere, Finland.

“Every time we meet in Tampere for Factory Acceptance Testing (FAT), it’s not only about the system and equipment,” he says. “It’s about sharing experiences, solving challenges together, and building a stronger partnership. I would describe our cooperation as a good and highly professional friendship.”

THIRTY YEARS AND COUNTING

With an already solid installed base and new investments underway, Sofidel’s journey with Valmet IQ continues to unfold. Tissue production faces evolving pressures, from growing sustainability demands to changing customer needs – and the cooperation continues to deliver solutions that allow Sofidel to adapt.

Celebrating 30 years of Valmet IQ in 2025, the long-standing partnership with Sofidel testifies to the technology’s enduring value.

Decades of proven performance, continuous development, and a shared commitment to sustainability ensure that their cooperation and trust will continue well into the future.

CONTACT

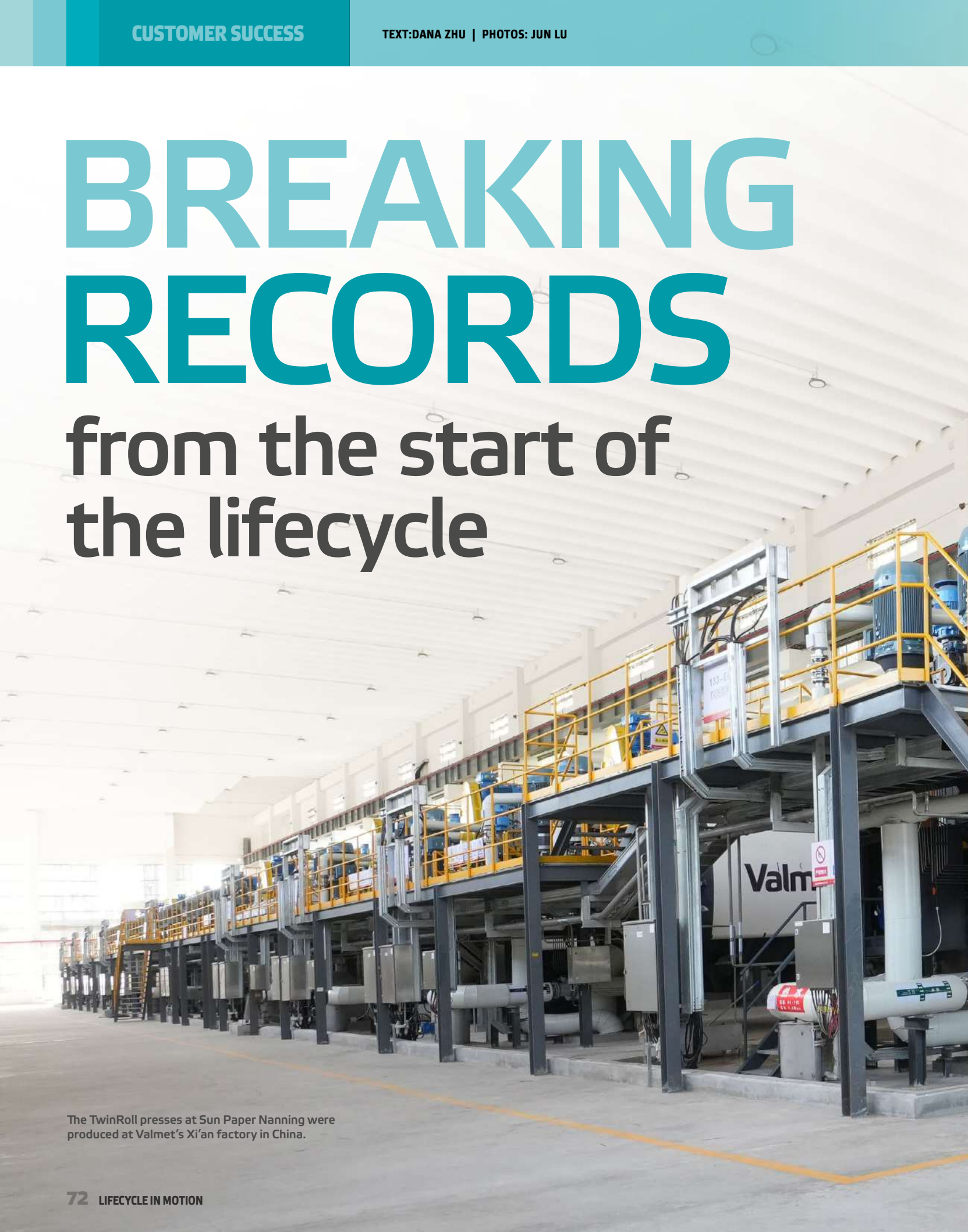
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**CLICK HERE
& WATCH
VIDEO**



BREAKING RECORDS

from the start of
the lifecycle

A wide-angle photograph of a large industrial facility, likely a paper mill. The image shows a long, straight line of industrial machinery, specifically TwinRoll presses, stretching into the distance. The machinery is complex, with multiple levels, yellow safety railings, and various pipes and components. The floor is a smooth, light-colored concrete. The ceiling is high with a series of white structural beams and recessed lighting. The overall atmosphere is one of a modern, large-scale industrial environment.

The TwinRoll presses at Sun Paper Nanning were produced at Valmet's Xi'an factory in China.

The background image shows a large industrial facility, likely a paper mill. A prominent feature is a large white machine with 'TwinRoll™' and 'Valmet' branding. The machine is surrounded by yellow safety railings and a set of stairs. Large white pipes run horizontally across the upper part of the image. The facility has a high ceiling with visible structural beams and large windows on the right side.

IN 2025, SUN PAPER STARTED UP THEIR SECOND-PHASE PULP LINE PROJECT IN NANNING MORE THAN TWO MONTHS AHEAD OF SCHEDULE. ONCE AGAIN, THEY COLLABORATED WITH VALMET FROM THE BEGINNING OF THE LIFECYCLE TO ACHIEVE SUCCESS.

SHANDONG SUN PAPER CO., LTD. in China continuously refines its integrated pulp and paper strategy. From pioneering their Beihai project in 2019 to the record-breaking start-up of the second-phase chemical pulp line in Nanning in 2025, they have been writing a new chapter in high-quality development.

Ying Guangdong, Deputy General Manager and Chief Engineer, Shandong Sun Paper Co., Ltd., says that as the capital of Guangxi, Nanning offers outstanding geographical advantages, abundant wood resources, and the logistical convenience provided by the Pinglu Canal, making it an essential choice for their expansion into the southwestern market.

REUNITING WITH VALMET IN NANNING

In March 2022, after Sun Paper took over the Nanning project's existing assets, it embarked on comprehensive upgrades and transformations. Valmet supplied the second-phase pulp line's digesting, washing, screening, and bleaching sections, focusing on producing high-quality bleached hardwood kraft pulp. The renewed collaboration stems from a successful partnership in the Beihai project. Deputy General Manager Ying remarks that Valmet is the industry's strongest company and a highly trustworthy supplier because of its comprehensive capabilities. "The successful experience of the Beihai project and Valmet's process technology's reliability were why we chose Valmet again," says Ying Guangdong.

MORE THAN TWO MONTHS AHEAD OF SCHEDULE

The second-phase pulp line project at Sun Paper Nanning set new industry benchmarks for construction and start-up speed, marking another highlight in the collaboration between the two parties. The project took only 18 months from contract signing to a successful start-up more than two months ahead of schedule. To ensure smooth system operation, optimization was prioritized after the chemical pulp line started up. By the end of November 2025, within about six weeks, the line had achieved full production capacity.

"We attribute the project's success to our highly capable and experienced young team, who are particularly rich in frontline production expertise. Special mention should be made of the team led by General Manager **Zhang Chao** of Valmet's Xi'an workshop, who facilitated the early delivery of Valmet's domestically produced TwinRoll press," enthuses Ying Guangdong.

From preliminary technical discussions and equipment supply to onsite installation and post-start-up guidance, Valmet provided full lifecycle services, offering critical support for the Sun Paper Nanning project's smooth progress and the training of pulp line personnel.

HIGH YIELD AND STABLE PRODUCT QUALITY

The second-phase pulp line in Nanning employs Valmet's continuous low-temperature cooking technology, featuring a two-vessel configuration for impregnation and digesting. It includes complete units for chip handling, impregnation, digesting, blowing, liquor circulation, and intelligent control. The system relies on low-temperature uniform digesting technology to achieve precise control, from raw materials to finished products, delivering high yield and stable product quality.

Aerial view
of Sun Paper
Nanning's
chemical pulp
line.



Valmet Delta Screen at
Sun Paper Nanning.



Ying Guangdong, Deputy
General Manager and Chief
Engineer, Shandong Sun
Paper Co., Ltd.



Valmet Continuous
Cooking system at Sun
Paper Nanning.



**“THE PROJECT TOOK
ONLY 18 MONTHS,
SUCCESSFULLY STARTING
UP MORE THAN TWO
MONTHS AHEAD OF
SCHEDULE.”**

Cooperation is very smooth
between the two teams
on-site.





Group photo of the Sun Paper Nanning and Valmet teams.

RELIABLE RESULTS WITH VALMET TECHNOLOGY

The chemical pulp line is equipped with 10 TwinRoll presses produced by Valmet's Xi'an workshop, and the operating capacity has exceeded the design capacity, with washing efficiency consistently above 90 percent. The line uses Valmet's Delta Screening Technology to seamlessly integrate both coarse and fine screening processes, and the bleaching section uses a three-stage Dht-EP-D1 bleaching process.

Between 80 and 90 percent of the valves used in the plant are Valmet valves. Sun Paper chose them again for this new project, having already used them in different lines in Yanzhou, Beihai, Zoucheng, and Nanning. Valmet services have provided technical support since the selection phase and are available 24/7 to discuss any issues over the phone. It is this reliable collaboration throughout the lifecycle that has made Valmet valves the default choice for Sun Paper over the past 14 years.

READY-TO-USE AUTOMATION

The intelligent control solution created by Valmet for Sun Paper Nanning enabled quick commissioning of the Valmet Digester Control System. Thanks to the excellent compatibility between the core instruments and automation systems, the system could be directly switched to closed-loop control without requiring a manual operation transition after onsite engineers completed instrument

testing. The system precisely reduces chemical and steam consumption, stabilizes pulp quality, and increases production capacity through closed-loop data analysis.

DEVELOPING LONG-TERM SUCCESS TOGETHER

Sun Paper has always adhered to a prudent and steady investment strategy. Ying Guangdong explains that enterprises adopt different investment strategies at different stages of development throughout the lifecycle. "We must always maintain rationality and common sense, guided by the principles of production based on efficiency, sales, and availability."

Valmet looks forward to continuing their close collaboration with Sun Paper, driving mutual progress through technological innovation.

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**"THE TWINROLL
PRESSES HAVE
EXCEEDED THE DESIGN
CAPACITY, WITH
WASHING EFFICIENCY
CONSISTENTLY ABOVE
90 PERCENT."**



Valmet Bleaching Tower at
Sun Paper Nanning.

Neles™ valve products are
used in key positions of the
second-phase chemical pulp
line at Sun Paper Nanning.



**"RELIABLE
COLLABORATION
THROUGHOUT THE
LIFECYCLE HAS MADE
VALMET VALVES THE
DEFAULT CHOICE FOR
SUN PAPER."**



PILOTING MUOTO PRODUCTS PRODUCED WITH VALMET 3D FIBER TECHNOLOGY

Metsä Spring and Valmet recently piloted Muoto products produced using Valmet's 3D Fiber technology at their joint demo plant in Äänekoski, Finland. Over the course of a month, the products were tested in three Food & Co restaurants at Valmet's Jyväskylä location, in cooperation with Metsä Spring and Compass Group. Metsä Spring's uncoated disposable plates were used for breakfast and lunch service, and laminated containers were utilized for pre-packed meals.

The products were perceived as high-quality and sturdy thanks to their multilayer structure, and resistant to both heat and grease. "The feedback we received was extremely positive and sparked great interest and discussion among customers," says **Satu Liimatainen**, Compass Group's Restaurant Manager.

NEW SOROCABA FACILITY STRENGTHENS FLOW CONTROL AND AUTOMATION SERVICES FOR PROCESS INDUSTRIES

Valmet is expanding its Latin American operations with the construction of a new facility in Sorocaba, São Paulo. The new facility will house a valve production unit, services workshops and Factory Acceptance Test (FAT) areas for Valmet's Flow Control and Automation Solutions businesses. With the new facility, Valmet further strengthens its capabilities to develop sustainable solutions close to customers, allowing faster delivery times.

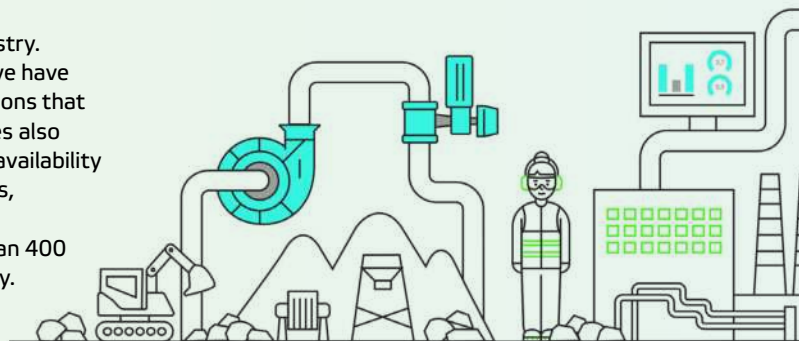
The construction of the new facility is expected to be completed during the first half of 2026. The new valve production unit will double the size of the existing plant currently located in Sorocaba and will serve customers in various process industries such as pulp and paper, mining, refineries, petrochemicals, and biofuels.



CELEBRATING 50 YEARS OF

In 2025, Valmet celebrated 50 years of service excellence in the valve industry. Since our beginnings as a maintenance and spare parts business in 1975, we have significantly expanded our services portfolio to include more tailored solutions that support our customers' reliability. Today, our extensive flow control services also encompass business solutions and digital services designed to ensure the availability of plants and minimize risks – we work closely together with our customers, partnering with them to meet their evolving needs.

We now have over 40 service centers worldwide and a team of more than 400 dedicated service professionals that support our customers' plant reliability. We are the service partner you can rely on throughout the whole lifecycle.



STRATEGIC MILESTONE WITH THE ACQUISITION OF SEVERN GROUP

In December 2025, Valmet took a significant step in the execution of 'Lead the Way' strategy by entering into an agreement to acquire Severn Group, a well established industrial valve company, from Bluewater, a UK-based private equity firm. Severn serves process industries globally and has over a 60-year track record of delivering specialized flow control solutions across the most demanding applications. The company employs about 950 people and manufactures mainly in the UK, USA, and India.

Severn's strong technologies, installed base and customer relationships with a diverse set of the world's largest blue-chip industrial companies support Valmet's growth strategy beyond its traditional core biomaterials business. This acquisition also further strengthens Valmet's Process Performance Solutions segment and position as a leading provider of mission-critical valve and valve automation solutions and services.

The acquisition is estimated to be completed during the second quarter of 2026, subject to customary closing conditions.



FLOW CONTROL SERVICES



SHAPING THE FUTURE OF PULP, PAPER AND PACKAGING, AND TISSUE TOGETHER

In March 2026, pulp producers from across the globe gathered in Sundsvall, Sweden, for Valmet Pulp Customer Days. Over two days, discussions focused on global pulp market developments, sustainability as a business opportunity, operational efficiency, and new value streams. The event also included demonstrations of Valmet's Automation, Flow Control, 3D molded fiber, textile recycling, LignoBoost and BioTrac solutions, along with a visit to the SCA Ortviken mill.

In June, Valmet will welcome further customers to Finland and Sweden to share insights and innovations advancing Tissue, and Packaging and Paper competitiveness.

NEXT-GENERATION VALMET IQ WEB MONITORING SYSTEM SETS A NEW BENCHMARK FOR PROCESS VISIBILITY, QUALITY AND EFFICIENCY

Valmet has introduced a renewed Valmet IQ Web Monitoring System (WMS), designed to elevate quality and efficiency in pulp, paper, tissue, as well as paper and board converting industries. The new WMS delivers exceptional image quality from a compact design and industry-leading illumination technology.

The system is fully integrated with Valmet DNA and Valmet DNAe, and it gives operators a clear, real-time view of process performance, with real-time insights and advanced analytics.

"The new system helps customers make faster, more informed decisions that improve productivity and profitability," says **Riina Markkanen-Ojala**, Business Manager, Machine Vision, Automation Solutions, Valmet.



NEW SERVICE CENTER AND MANUFACTURING UNIT IN SYDNEY, AUSTRALIA

Valmet has strengthened its flow control capabilities in Australia with the inauguration of a new service center and a manufacturing unit in Sydney. This will enhance the availability of mission-critical flow control solutions and services for customers in process industries across the region, with a particular focus on Australia's pulp, paper, mining and metals, refining, chemicals, and renewable energy sectors.

"The new location in Sydney is a strategic investment that strengthens our local presence and enables us to support customers with faster service, closer collaboration, and local engineering expertise," says **Henri Huovinen**, Vice President, Flow Control Asia Pacific market area, Valmet.



SLITTER MANAGEMENT PROGRAM ENHANCES HELLEFOSS OPERATIONS

Valmet has helped Hellefoss Book Paper AS significantly improve slitting efficiency and cutting quality at its mill in Hokksund, Norway. Facing challenges with worn equipment, dust, and lengthy top slitter changeover time, the mill entered a two-year Slitter Management Agreement with Valmet. The program included leased slitters, superfinishing sharpening, logistics and inventory control. In addition, Valmet delivered nine Valmet Slitter Holder Quick Change with adapters.

The new system has dramatically improved operational performance. Top slitter change times have reduced significantly and the top slitter lifetime is now 5 to 6 times longer than before. Slitter edge sharpness and cutting quality improved noticeably, and dust generation has been reduced. With this investment, Hellefoss has improved slitting efficiency and paper roll quality, and also strengthened their workplace safety and sustainability.



RECENT VALMET START-UPS

Wuzhou Special Paper, China, started up a new winder on PM 19, April 2026.

Anhui Linping, China, started up their PM 8 board line, March 2026.

Velvet CARE, Poland, started up an Advantage DCT tissue line, December 2025.

Sun Paper Nanning, China, started up its Phase II chemical pulp production line, September 2025.

Liansheng Paper, China, started up Line 1, Phase 2 of their BCTMP project, September 2025.

JK Paper, India, started up a new BCTMP plant at their Songadh mill, April 2026.



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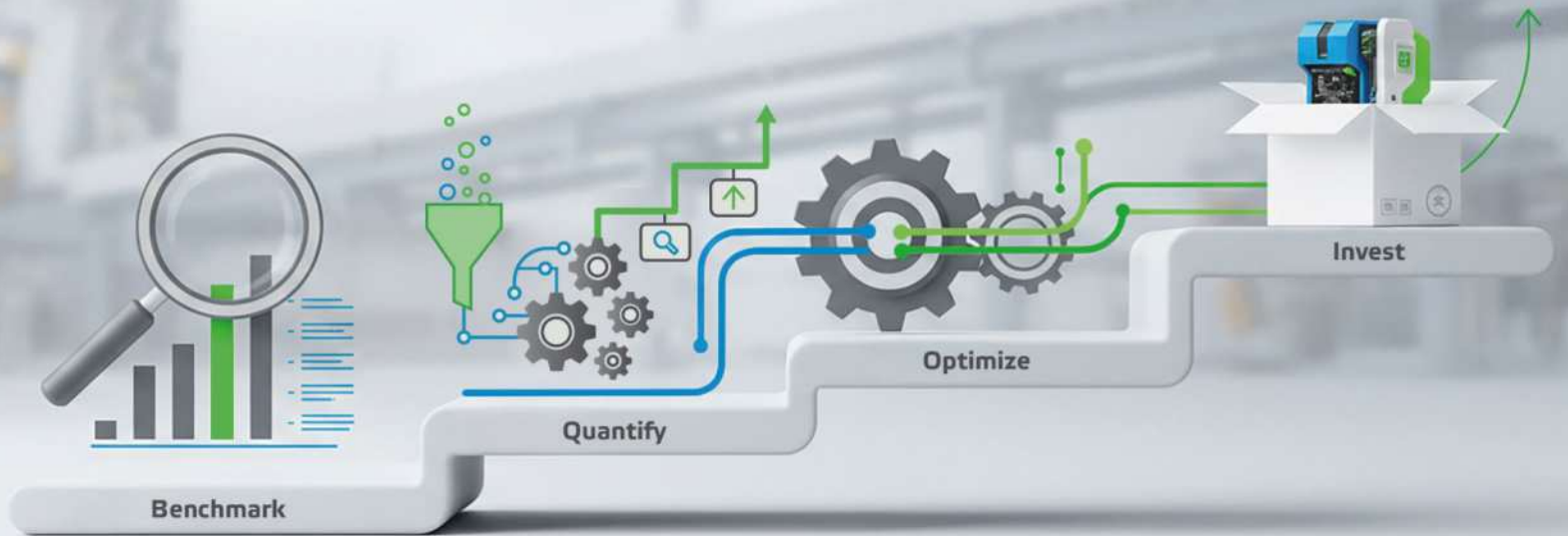
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Resource efficiency in board and paper making

Valmet's 4-step approach – Discover your improvement potential and turn it into action

Rising sustainability demands are pushing board and paper producers to do more with less. Resource efficiency means using energy, water, and raw materials smarter - without compromising productivity or quality.

Valmet's 4-step approach benchmarks your current performance, identifying the most impactful improvement areas and turning them into a targeted roadmap that improves production cost competitiveness, enhances sustainability, and supports your path toward a regenerative tomorrow. Start your 4-step journey toward resource efficiency with Valmet today.

Find out more

