diagram

#190 / June 2025

the Bühler magazine

Multiplying impact together

SUSTAINABILITY IS STRATEGY

JOHAN ROCKSTRÖM ON WHY BUSINESS MUST LEAD THE WAY

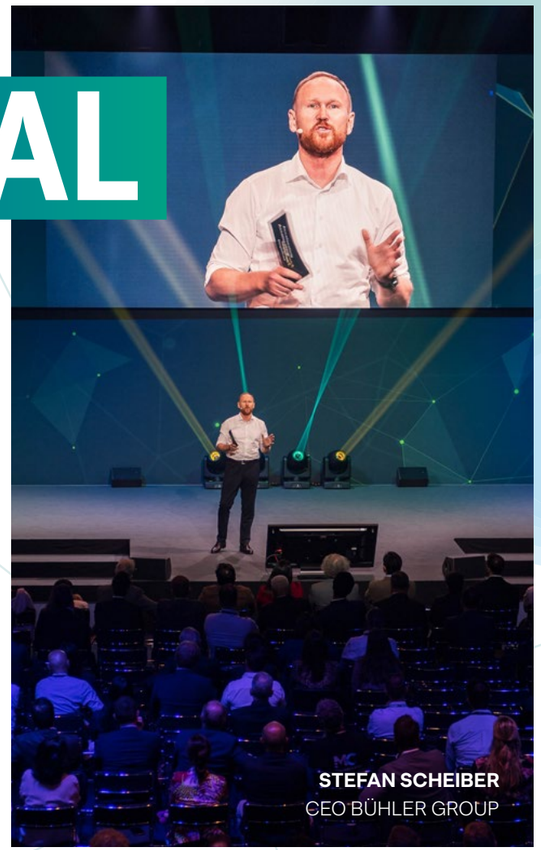
CIRCULARITY FROM FIELD TO FORK

ANDRIANI TURNS SIDE STREAMS INTO PASTA DREAMS

RAISING THE BAR IN MILLING EDUCATION

NEW MILLING ACADEMY LINKS LEARNING AND INNOVATION

EDITORIAL



STEFAN SCHEIBER
CEO BÜHLER GROUP

DEAR READERS,

As business leaders, many of us around the world are facing highly dynamic markets and a very uncertain environment. In turbulent times, it can be tempting to take a cautious approach. But that is not always the best advice. As Ranjay Gulati, Professor of Business Administration at Harvard Business School, powerfully argues, the most effective way to deal with uncertainty is to be courageous and to take action. It is only by taking action that we learn and create a path forward.

This is a message we take to heart at Bühler. As we host our fourth Networking Days – our flagship industry event – we are more determined than ever to show that by tackling challenges, we create opportunities. We are committed to developing solutions that increase your operational gains and reduce costs, making your business more competitive and resilient. At the same time, these solutions reduce waste by valorizing side streams, improving energy efficiency, and increasing yields to optimize the use of raw materials.

Many of you – our customers and partners – are already experiencing these benefits. Just one example is the Italian food producer Andriani. This highly innovative and competitive company has built sustainability and circularity into its processes at every step and as a result is achieving its goals and thriving in its markets.

As Professor Johan Rockström, a leading expert on global sustainability, points out, our understanding of sustainability has expanded. It's no longer just about conservation and environmental protection. We now think of it as central to competitiveness, security, stability, and health. There are many real-world examples among our customers and partners that show that sustainable practices are integral to business success, improving performance, offering a competitive advantage, driving job creation, and opening up new markets.

That's why we believe it's important to highlight these stories. We share them in Diagram because true impact happens when we collaborate across entire value chains. By exchanging knowledge and inspiring action, we can create a multiplier effect – scaling solutions and developing successful businesses over the long term.

In times of unpredictability, true leadership is what shapes the future. As leaders in industries around the globe, the choices we make today will define the world we live in tomorrow.

We hope you enjoy this issue of Diagram, and we thank you very much for choosing to work with us.

Sincerely yours,
Stefan

IN THIS ISSUE

DIAGRAM #190 | JUNE 2025

MAKING IMPACT

ON THE COVER

One bold move can spark a chain reaction. When many take bold steps in the same direction, rethinking systems, reducing impact, embracing change, their efforts combine and amplify. What starts as a ripple becomes a wave, proving that collective action drives true transformation.

18

12

TAKING ACTION

56

BEING BOLD

THE RIPPLE EFFECT

WHEN ACTIONS MULTIPLY

TEXT: MICHÈLE BODMER

In nature, a single drop of water can send ripples across an entire pond, its impact extending far beyond the initial splash. This phenomenon, known as the ripple effect, is a powerful reminder of how one action can influence a larger system.

Whether it's a raindrop falling into a lake or a breeze stirring waves in the ocean, nature shows us that even the smallest movements can create momentum and transformation.

This same principle applies to the worlds of technology and industry. Every breakthrough, partnership, and bold decision has the potential to create ripples – spreading knowledge, inspiring action, and driving progress. The true power lies in the multiplier effect: when these ripples connect and amplify one another, they create waves of change. By working together, businesses and industries don't just add incrementally to progress – they accelerate it in many directions, compounding their influence and scaling solutions far beyond what any single effort could achieve.

Together, we can turn ripples into waves. Let's multiply impact together.

MULTIPLYING IMPACT TOGETHER

TEXT: JANET ANDERSON

The businesses of the food, animal nutrition, and mobility industries meet fundamental needs of the world's growing population every day. This requires adapting to unexpected changes and rising to new challenges. In the midst of increasing uncertainty, it takes courage to act, but by doing so, the players in these industries can shape a better future and multiply impact together.

Professor Ranjay Gulati during his speech at the Bühler Networking Days 2022. At this year's event, he is focusing on the topic "How to Be Bold."

FIRST LAUNCHED IN 2016, Bühler's Networking Days was conceived as an opportunity for businesses in the food, animal nutrition, and mobility sectors to come together and share ideas while inspiring and motivating change. As Stefan Scheiber, CEO of Bühler said at the inaugural event: "Let's ensure that over the coming months and years we are creating the impact that is absolutely necessary."

Scheiber's call met with strong resonance across these industries. Since then, business leaders, start-ups, scientists, and academics have gathered every 3 years in Uzwil, Switzerland, with the aim of driving this important idea forward.

In June 2022, Bühler held its third Networking Days. A thousand representatives of businesses in the fields of food, mobility, and animal nutrition gathered to discuss how innovation, technology, collaboration, and education can address the challenges of climate change, biodiversity loss, and wealth inequality. As the event made clear, the tools to address these challenges already exist. To realize their potential, what was needed was even greater collaboration across sectors and industries to accelerate impact towards a more sustainable future.

Back then, Scheiber called on industry members to act together to create this impact and emphasized the importance of innovation.

"In our industries, the innovation rate has never been as high as it is now. This creates impact. We need new technologies and widespread collaboration to tackle new challenges, and at the same time to secure the future of our businesses in a responsible way," he said. "There is massive potential to drive meaningful change in so many important areas. Together we can, and we will, create a better, fairer, more sustainable world for future generations."

Since 2022, the challenges have grown, and the world has become even less predictable. The future feels uncertain. In such a world, it is easy to become overly cautious. But it is essential not to submit to fears. "The currency to survive in an era of uncertainty is courage," says Ranjay Gulati, Professor of Business Administration at Harvard Business School. "You have to act your way into knowing."

This is a period defined by uncertainties – political, economic, societal, environmental, and technological. Businesses are accustomed to dealing with risks, but today's uncertainties go beyond typical risks. Risks can be quantified; businesses can build models based on available data and calculate the probabilities of different outcomes.

PROF. RANJAY GULATI

Ranjay Gulati is the Paul R. Lawrence MBA Class of 1942 Professor of Business Administration at Harvard Business School and author of "Deep Purpose: The Heart and Soul of High-Performance Companies." His new book, "How to Be Bold: The Surprising Science of Everyday Courage," will be published in November 2025. Gulati is one of the world's most influential thought leaders on innovation, purpose-driven business models, organizational strategy, and leadership.

Uncertainty is a different challenge altogether – it feels like entering unknown territory, there is little or no data, it's not clear what the outcomes might be, and it is impossible to calculate probabilities.

The effect can be paralyzing. "You have to understand how the human brain responds to uncertainty," explains Gulati. "We can handle risk, but uncertainty creates in our minds a sense of loss of control, and loss of control triggers a primal emotion, fear. Fear is a survival emotion that hijacks the brain and stops it working properly. We can't process. We don't know what's going on. And we're confused. This is hardwired in the human brain. We're not very good with uncertainty."

Humans, however, are great survivors, always looking for ways to overcome challenges. Curiosity, inventiveness, and optimism are also hardwired into us, it seems. And when the challenges feel unsurmountable, we have yet another tool at our disposal. "The way in which we deal with uncertainty, as individuals, leaders, and collectively, is through courage," says Gulati. "Courage is taking action in the face of fear, learning to conquer fear."

Cultivating courage

Now, more than ever, people running businesses and making decisions need to call on this special capacity of humankind. But is this something you can train and build? Can you become more courageous than you are? These are urgent questions that Gulati addresses in his new book "How to Be Bold," which will be published later in 2025. The book offers a science-based playbook for cultivating courage to deal with uncertainty.

To find the answer to these questions, Gulati interviewed a range of people from a variety of backgrounds who have shown courage in the face of adversity. He discovered that these people did one of two things. One thing they all did, he found, is they created strategies to reduce the fear or tame the fear. They convinced themselves they had confidence. They said to themselves: I have a team, I have people behind me, I have a plan B, I've thought about scenarios.

But in some cases, even this was not enough. The people Gulati interviewed had tried to reduce uncertainty in every way possible, but sometimes they found they could not do it. And yet they went ahead and acted. This is where the second approach kicked in. "I started to see that in organizations, leaders not only had courage in themselves, but in their teams. In fact, their teams gave them more courage and they gave their teams more courage," says Gulati.

This mutual support is a powerful way of overcoming fear and taking action. In uncertain times, leaders must empower people to be courageous. "When the outcome is not predictable, you have to

create space for experimentation," explains Gulati. "You don't have all the data, you'll never have all the answers, so you create the space and capacity for failing and learning."

Act your way into knowledge

Testing the way forward is not just a means of finding a path through darkness. It is not just a means of survival. It is more than that – through experimentation we start to create a path where none existed. "Sometimes you have to act your way into knowing," says Gulati. "You have to act, knowing that what you're doing may not be right, but doing something will give you more data. You can use that data to take the next steps and correct your course if needed."

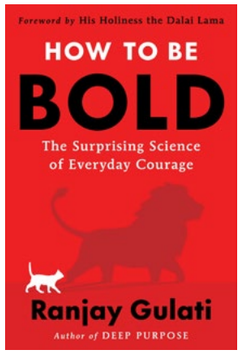
Gulati likens this technique to the point-to-point navigation used by ancient mariners. They did not know where their ultimate destination lay, or if it even existed, but they could see the next island. So, they aimed for that and from there, with that new perspective and the data that they had gained, they set their course to the next point.

One thing is clear from this, says Gulati. If the only way to find the path in the dark is by taking the first steps, then the riskiest thing you can do is to do nothing. "In today's times of uncertainty, it is very common for people to freeze up and do nothing, to wait, or run and hide," he says. "We need courage in ourselves and in our leaders to take bold action. We are all more resilient when we are able to move forward in the face of uncertainty."

2025 – the year in which Bühler holds its fourth Networking Days – has certainly started in a dynamic and turbulent manner for people and businesses across the world. The additional challenges it has created call for the kind of agile leadership that Gulati describes. If business leaders are courageous in their actions now, they will also discover new opportunities. "In these times, we need leadership with cool heads, strong hands, and warm hearts," Scheiber says. "The ability to navigate successfully in these circumstances, not only seeing risks but also leveraging strengths, is a key success factor. We must pull together."

Today, it is more important than ever for industries across the globe to connect, collaborate, and act as a unified force for good. By bringing industry members together once again at its Networking Days, Bühler aims to harness the collective power of courage, shared purpose, and optimism to drive meaningful and lasting positive change at scale and multiply impact together.

"We can ensure that systems use less energy and water, we can increase the efficiency of our value chains, and we can optimize our processes to produce less waste. We can invest in research and development to bring new low-emission solutions to market," says Scheiber. "Our new technologies can make a big difference. As we say at Bühler, we make things happen. Now is the time for action. Together we will create the future."



Ranjay Gulati's book will be published in September 2025.

"NAVIGATING SUCCESSFULLY IN THESE CIRCUMSTANCES MEANS NOT ONLY SEEING RISKS, BUT ALSO LEVERAGING STRENGTHS. THIS IS A KEY SUCCESS FACTOR."

STEFAN SCHEIBER
CEO Bühler Group

SUSTAINABILITY IS STRATEGY –

WHY BUSINESS MUST LEAD THE WAY

PHOTOS: LUKAS NAEF
INTERVIEW: IAN ROBERTS

Professor Johan Rockström, a leading expert on global sustainability, met with Bühler CTO Ian Roberts at the Potsdam Institute for Climate Impact Research to discuss the Planetary Boundaries framework. As its architect, Rockström highlights the urgent need for industry to operate within Earth's safe limits, emphasizing that sustainability is now key to resilience, competitiveness, and long-term success.

Professor Johan Rockström, architect of the Planetary Boundaries framework.

IAN ROBERTS: It's a great pleasure to meet you, Professor Rockström. Could you share how the Planetary Boundaries framework first came into being – and explain why it has become so critically important in today's world?

PROFESSOR JOHAN ROCKSTRÖM: The Planetary Boundaries framework was an inevitable logical step in scientific progress because our understanding of three areas has advanced in an extraordinary way over the past 30 years, changing our comprehension of the complexity and fragility of the Earth's systems.

First is the Anthropocene – the exponential rise of human pressures on the planet since the 1950s. For millennia, human impacts were relatively linear. Then, with the Great Acceleration of population growth and fossil fuel utilization, human activity became a dominant force. We've essentially become a geological force of change, shaping the planet's future trajectory.

Second is paleoclimatic research. Ice core data shows the Holocene – a warm, stable interglacial period – has been the cradle of civilization. It maintained a remarkably narrow temperature range for 10,000 years. This stability allowed us to develop agriculture, build societies, and enjoy the predictability that underpins modern life. It's clear now: We want to keep the planet as close as possible to a Holocene-like state.

Third, we now understand that Earth is a complex, self-regulating geophysical system with intricate interactions and feedbacks. Push these systems too far and, instead of stabilizing the planet through dampening feedbacks that counterbalance human pressures, they can flip, creating self-amplifying loops that accelerate global temperature increases, degrade ecosystems, and weaken the planet's resilience. These are tipping points, where small changes trigger large, potentially irreversible impacts.

When you combine these insights, it leads naturally to the question: Can we define a safe operating space that avoids destabilizing the system? That's the basis of the Planetary Boundaries.

We are, in fact, a geological force of change on planet Earth. We're hitting the hardwired biophysical processes that regulate the functioning of the whole system. The Holocene is our Garden of Eden, and tipping points are real. When you bring all of this together, two questions arise quite naturally: Are we putting the planet at risk? And if we know what to measure against, can we use tipping points as evidence to define a safe operating space that avoids irreversible damage to the system?

That's a compelling foundation. Turning that science into a practical framework must have been a major challenge. How did you define those boundaries in operational terms – and how do we know when we're crossing them?

ROCKSTRÖM: Once we had the scientific evidence that the Holocene is our reference point – and that Earth has tipping points – we asked: What are the key environmental processes that regulate the stability and resilience of the planet? And can we define measurable thresholds for each?

That led us to identify nine Planetary Boundaries. For each, we define control variables – quantifiable indicators that tell us whether we are operating in a safe zone. The safe zone is where there's a high likelihood of staying in a Holocene-like state. Once we cross a boundary, we enter a zone of increasing risk. Go too far, and you may cause irreversible shifts.

Over the past 15 years, the framework has been scrutinized and refined. We've now published more than 1,500 peer-reviewed papers on this. And today, we can say with high scientific confidence that six of the nine boundaries have already been transgressed. That's alarming. But it's also empowering, because it shows we can measure the planet's health – and we know what it takes to get back into the safe zone.

That really reframes how we think about managing the planet. You have mentioned that climate change is just one of the boundaries. Could you walk us through some of the others – and why it's critical we look at the whole Earth system, not just carbon?

ROCKSTRÖM: Even if we focused only on climate, we'd fail unless we take a full Earth system approach. There are nine boundaries. Climate change, the stratospheric ozone layer, and ocean acidification are what I call the "big three" – they have tipping points at planetary scale.

Then there are four biosphere boundaries: biodiversity, land use, freshwater, and nutrient cycles. These are like the planet's operating system. Disrupting them weakens resilience and accelerates climate risks. For example, even if we phase out fossil fuels, we'd still breach climate targets if we continue degrading forests and ecosystems.

So we have climate, oceans, and ozone as the global-scale boundaries, and four biosphere boundaries that underpin resilience. What about the remaining two boundaries? How do they fit into the picture?

ROCKSTRÖM: That's where it becomes even more systemic. The eighth boundary is what we call "aerosol loading." It refers to air pollutants – like sulfates and nitrates – that affect not only human health but also cloud formation and the planet's energy balance. It's a paradox: air pollution harms people, but some of it also cools the planet by reflecting solar radiation. As we reduce pollution – which is necessary – we lose that masking effect and warming accelerates. It shows how interlinked everything is.

The ninth is "novel entities" – human-made chemicals like microplastics, pesticides, and nuclear waste that don't exist in nature. We're seeing them accumulate in ecosystems globally. The challenge is, we don't yet have clear thresholds. But we know they're spreading fast, and that adds another layer of risk.

Together, these nine boundaries define the safe operating space for humanity. And what's important is that this isn't a list of environmental concerns – it is the list of the processes that we must be stewards of to have a stable planet. This is not about environmental protection or sustainability; this is about prosperity, equity, and security. This is about health.

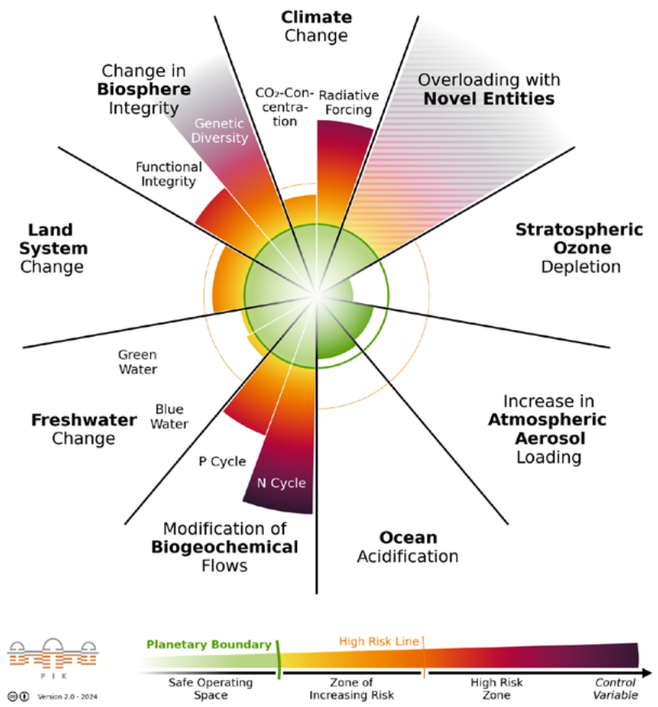
Could we envision this as a control center for monitoring the health of the planet and supporting leaders to make smart decisions?

ROCKSTRÖM: That's exactly what we're working on. With Earth observation satellites, AI, and big data, we're designing a "mission control center" for planet Earth. It would provide a real-time diagnostic of how we're doing across the nine boundaries and give us budgets we have to stay within. But the most exciting part is that we want to be able to have real-time updates showing where overshooting is happening, right down to specific regions or ecosystems.

The idea is to make this system actionable. We want it to serve not only as a global dashboard, but also as a decision-support tool. If you can track deforestation in the Amazon or nitrogen loading in Europe in near real time, you could intervene more intelligently – and much earlier. What's more, once you quantify environmental limits, you also see who is using how much. This addresses the fair distribution of those budgets. Today, for example, some countries massively over-consume nitrogen, while others – often in the Global South – underuse it. So, the system would not just guide action; it would help us distribute responsibility more justly.

Bühler CTO Ian Roberts and Professor Johan Rockström discuss Planetary Boundaries and business leadership at the Potsdam Institute for Climate Impact Research.

PLANETARY BOUNDARIES – DEFINING A SAFE OPERATING SPACE FOR HUMANITY



Graphic: The Potsdam Institute for Climate Impact Research

That's a powerful idea. But we live in a time of geopolitical instability and growing skepticism. Can the Planetary Boundaries framework still serve as a guide in this kind of environment?

ROCKSTRÖM: More than ever. In the midst of this challenging time, the framework is a science-based, neutral approach that can guide investments and decisions for the global economy. Today, we have succeeded in moving away from thinking of sustainability only as conservation and environmental protection. We must think of it as central to competitiveness, security, stability, and health.

The Planetary Boundaries define the conditions under which humanity can thrive safely on Earth. And they give us something we've never had before – a way to measure our progress, understand the risks we face, and course-correct when needed.

What's encouraging is that every one of the nine boundaries already has some kind of international policy attached to it. We have the Montreal Protocol for the ozone layer, the Paris Agreement for climate, the Convention on Biological Diversity, and others addressing crucial aspects of planetary stewardship. The challenge is not lack of intent, it's that we haven't bent the curves yet. We now have the science, the tools, and the urgency to make that shift.

PROF. JOHAN ROCKSTRÖM

Professor Johan Rockström is Director of the Potsdam Institute for Climate Impact Research and Professor in Earth System Science at the University of Potsdam. Johan Rockström is an internationally recognized scientist on global sustainability and Earth resilience. He led the development of the Planetary Boundaries framework for human development in the current era of rapid global change. He is deeply involved in research on the future trajectory of the Anthropocene and tipping points in the Earth system. With more than 25 years' experience in applied water research in tropical regions, he is also a leading scientist on global water resources.

What are your three key messages for business and industry leaders?

ROCKSTRÖM: First, if you see business benefits from sustainability, talk about them. When a decision improves your performance, attracts talent, opens new markets, or enhances resilience – communicate that clearly. We need more real-world examples that show sustainability is not a burden – it's a competitive advantage.

Second, go beyond carbon. Many companies have made great progress on climate, but the science tells us that's not enough. We need to manage the full set of planetary pressures: land use, biodiversity, materials, and water. You don't need to tackle all nine boundaries at once, but you can start by addressing the ones most relevant to your value chain.

Third, be more public. I know that's not always comfortable, but business leaders need to use their voices. This is not about being on the barricades. It's about showing leadership in a time of uncertainty – defending the path away from planet-damaging value chains and proving that this is beneficial. That is fundamental, for me, right now.

CIRCULAR ECONOMY STARTS WITH DESIGN

INTERVIEW: BURKHARD BÖNDEL

How can we successfully shift from linear consumption to true circular systems? And why is the circular economy about much more than just recycling? We explore these questions with Julia Binder, Professor at the International Institute for Management Development (IMD) in Lausanne and a globally recognized expert in sustainable transformation.

BURKHARD BÖNDEL: Let's start with your personal journey: How did you get into sustainability and specifically the field of circular economy?

PROFESSOR JULIA BINDER: My entry into the world of sustainability was a journey of self-discovery. I originally studied marketing and began to question the constant promotion of new products and the emphasis on driving consumption. During my studies in Edinburgh, I was introduced to the concept of sustainability marketing. It was during this period that I realized that I wanted to use my skills to create meaningful, positive impact. So, I began to study circular economy in depth, particularly the cradle-to-cradle principle. According to this principle, products are designed so that all materials are either biodegradable or can be fully reused after usage as raw materials – without any loss of quality and without generating waste. This inspired me to write my master's thesis on circular economy.

What has changed in the field of the circular economy since then? Have we actually made any meaningful progress?

BINDER: Unfortunately, I have to say that less has changed than I had hoped. The concept of circular economy is better known today and is recognized by more companies, but practical implementation often falls short of expectations. Many associate circular economy mainly with recycling, but recycling is not the goal of circular economy, it's the last option – only after all means of preserving or increasing the value of resources, such as reducing, reusing, repairing, and refurbishing, have already been exhausted. The real challenge is to design products from the outset in such a way that they can be integrated into a closed loop.

In your book "Circular Business Revolution," you delve deeply into these issues. What are the key takeaways for companies aiming to meet the challenges of the circular economy?

BINDER: We emphasize that circularity shouldn't just be another buzzword. It's a means to unite profitability, growth, and sustainability. Companies should not treat the circular economy as a standalone goal but as an integral part of their business strategy. We argue that it's not just about incremental improvements, but about genuine, transformative innovation. Companies need to understand that the circular economy can help them remain future-proof by fostering resilience and enabling new business models.

In your book, you mention five archetypes of the circular economy. Could you explain them in more detail?

BINDER: The five archetypes are:

Optimize resource use: This is how companies can use their resources more efficiently and reduce dependencies. One example is the switch from fossil to bio-based materials, which often also saves costs.

Capitalize regeneration and restoration: This includes investing in regenerative agriculture and monetizing it. Companies can not only secure their supply chain but also generate additional revenue through the sale of carbon and biodiversity credits.

Monetize extended product life: This is how companies can make money by extending the life of their products. This can be done through repairs, upgrades, or the modularity of products.

Valorize waste: This archetype views waste products as valuable resources. One example is the use of used frying oils to produce biofuels.

Servitize products: This approach transforms products into services. Companies offer products as a service, which increases customer loyalty and reduces material consumption at the same time.

How important is design in this entire process?

BINDER: Design is absolutely central. Around 80 percent of a product's characteristics – including its recyclability – are determined in the design phase. The decisions made here have a huge impact on the environmental footprint. Unfortunately, designers are often neither trained nor incentivized to develop sustainable solutions. This is where companies need to rethink their approach – to design products that are easy to repair and recycle.

What role should policy play in this context?

BINDER: Policy can play a major role by setting the right framework. Ideally, social and environmental costs should be internalized in a product's price. Right now, we have a situation where the real costs are not reflected in prices — they're borne by society and the environment. It's a complex geopolitical issue, and I don't believe we'll see a global agreement anytime soon. That's why companies must act proactively and create economic incentives to develop sustainable business models.

PROF. DR. JULIA BINDER

Dr. Julia Binder is Professor of Sustainable Innovation and Business Transformation and Director of the Center for Sustainable and Inclusive Business at IMD in Lausanne, Switzerland, a globally renowned business school known for its hands-on Executive Programs, with a special focus on sustainable business management and circular business models. Her academic career began with a degree in marketing and then led her to the Technical University of Munich and the Swiss Federal Institute of Technology Lausanne (EPFL), where she specialized in sustainability. In research and practice, she is dedicated to the question of how companies can combine ecological change and economic success through circular business models. In 2024, she published the books "The Circular Business Revolution" (Pearson) and "Leading the Sustainable Business Transformation" (Wiley).

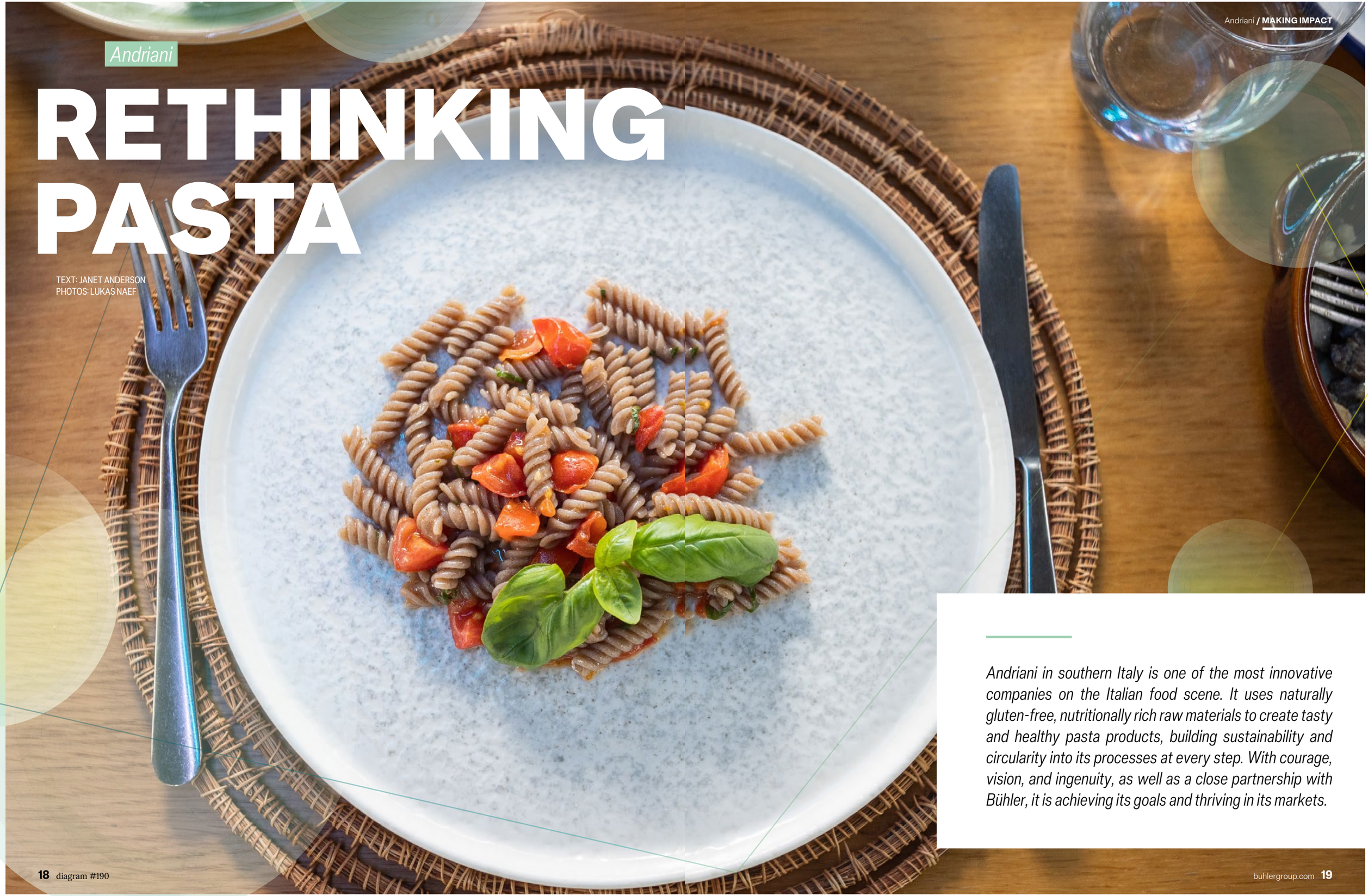
Can you give us some examples of companies that are successfully implementing circular economy principles in practice?

BINDER: Sporting goods retailer Decathlon is a great example. They're rethinking how to offer products as services instead of just selling them. Another example is the chemical company BASF. It is working intensively to optimize its processes and reintegrate materials into its production cycle. Technology conglomerate Siemens is also innovative. They design trains that can be recycled at the end of their life cycle. These companies show that combining economic success with sustainability is possible.

Andriani

RETHINKING PASTA

TEXT: JANET ANDERSON
PHOTOS: LUKAS NAEF



Andriani in southern Italy is one of the most innovative companies on the Italian food scene. It uses naturally gluten-free, nutritionally rich raw materials to create tasty and healthy pasta products, building sustainability and circularity into its processes at every step. With courage, vision, and ingenuity, as well as a close partnership with Bühler, it is achieving its goals and thriving in its markets.

AMONG THE OLIVE GROVES and rolling hills of Puglia in southern Italy, the ancient town of Gravina is home to Andriani S.p.A., one of Italy's most innovative pasta-making companies. Here, in the heart of a traditional pasta-making region, visitors are immediately impressed by the company's vibrant atmosphere, its spirit of curiosity and openness, and the deep commitment to sustainability that shines through everywhere.

The company was founded in 2009 by the brothers Michele and Francesco Andriani, who inherited 40 years of milling know-how from their father, Felice. "At the beginning, we were focused on identifying technology that could allow us to make very good products," says Michele Andriani, CEO. "But the real inspiration came when we saw that by combining our technology with the natural beneficial power of our ingredients, we could have a positive impact on people's health and on our planet."

Today, Andriani's factory in Gravina is entirely dedicated to making gluten-free pasta, producing 40,000 tonnes of pasta a year from over 60 different raw materials in over 90 different recipes – and it implements circular economy principles wherever possible with the aim of becoming carbon neutral in its own operations. It has also expanded and opened a second pasta factory in Canada.

Key to achieving its goals is a close partnership with Bühler and a shared set of values. "What brought us together was Andriani's vision to transform any side stream or waste stream from its pasta production into something valuable and healthy for people and the planet," explains Giulia Manzolini, Team Manager for Environmental Quantification at Bühler. "We help Andriani to do this by combining many different solutions from our diverse portfolio, from grain reception and milling to pasta lines, pet food production, and environmental impact services."

Pasta with impact

The market Andriani serves is growing at a higher pace than conventional pasta. Over recent years, demand for gluten-free products has increased significantly, as has appetite for new products. As a result, Andriani's products are no longer solely aimed at people with food allergies, but at everyone.

"Gluten-free pasta offers an alternative to conventional pasta that provides other attractive characteristics and benefits. For example, you can have all the nutritional benefits of lentils in a traditional pasta shape," says Filippo Gavarini, Green Energy Specialist at Andriani. Lentils are also a good source of plant-based protein – an advantage for those looking for a more sustainable diet.

Playing in a wider market enables growth but also means greater competition. Optimization and efficiency are therefore essential to maintain high product quality at a competitive price. The great challenge is to combine this with a high degree of flexibility. Diversity is at the core of Andriani's operations: 15 different plant species, including cereals, pulses, vegetables, and superfoods, are transformed into a wide range of different pasta products for a variety of major brands, each with its own requirements, as well as for Andriani's own brand, Felicia.

A multi-talent

The collaboration with Bühler began in 2010 with a pasta plant for maize and rice, but Andriani was soon looking into other possibilities. In 2016, the companies co-designed Andriani's multigrain mill. It is a true multi-talent and unique in Italy, processing buckwheat, brown rice, quinoa, corn, amaranth, lentils, peas, chickpeas, mung beans, and more. It has to be able to handle quick changes between raw materials that vary greatly in terms of granulometry, color, and other characteristics, making it a unique combination of flexibility with efficiency.

"For us, the multigrain mill is the beating heart of the company," explains Gavarini. Here the grains are sorted, processed, and mixed. Equipped entirely with Bühler solutions, including a new Bühler Diorit four-roller mill, flexibility, efficiency, and waste reduction all come to the fore here. The sequence of changes is planned carefully according to the color of the raw material being processed – from white to yellow corn, chickpeas to buckwheat. This maintains the quality of the product while reducing waste.

The mill is special in another way, too because it is here that the extra process step occurs that enables Andriani to create gluten-free pasta. Gluten is the glue that enables pasta to retain its shape. Without gluten, the chemical composition of the starch has to be changed by adding pressure and heat to gelatinize it. In Bühler's extruder the raw materials are processed into pellets that are then dried and reprocessed to make flour. "We did a lot of experimentation with Bühler to get this gluten-free process right. We tested different recipes, pressure, and heat," says Gavarini.

Energy is a major topic throughout the plant, including in the pasta lines themselves. Andriani has installed seven Bühler pasta lines, capable of producing over 20 different shapes of pasta and ensuring food safety, quality, and efficiency. The Ecothermatik line, for example, recycles heat, and therefore uses 40 percent less thermal energy. Reducing energy consumption and reusing energy are important first steps. To meet its remaining demand, Andriani adopts renewable sources wherever possible. For example, a photovoltaic system covers all the roofs of the facility, producing

"WE ARE FORTUNATE IN HAVING A BUSINESS PARTNER LIKE BÜHLER. IT IS THROUGH THE EXCHANGE OF KNOWLEDGE FROM OUR ECOSYSTEMS THAT IDEAS TAKE SHAPE AND TOGETHER WE PREPARE FOR THE FUTURE."

MICHELE ANDRIANI
Founder and CEO at Andriani

Andriani makes 40,000 tonnes of gluten-free pasta a year from over 60 different raw materials in over 90 different recipes, implementing circular economy principles wherever possible.

"WHEREVER POSSIBLE WE UPCYCLE SIDE STREAMS AND WASTE STREAMS SO THAT THEY GAIN VALUE IN BOTH A NUTRITIONAL AND ECONOMIC SENSE."

FILIPPO GAVARINI
Green Energy Specialist at Andriani

10 percent of the electric energy used annually. A combined cooling, heat, and power trigeneration system produces 45 percent of the electric energy, 25 percent of the superheated energy, and about 50 percent of the cooling energy needed for their production processes. This allows them to save some 20 percent of primary energy. In addition, together with Bühler they have installed a Vyncke biomass boiler.

"Our aim is that this will replace the gas boilers that we currently use for the production of thermal energy," says Gavarini.

The biomass boiler is also the link between optimizing energy inputs to reduce the carbon footprint and optimizing the use of raw materials through circular economy practices because it is fueled by a byproduct from the mill. Discarded hulls of buckwheat are mixed with cuttings from pruned olive trees and other wood by-products from the local agricultural sector, giving new life to what was previously considered waste. Key to making this work is identifying the optimal use for each side stream. "Wherever possible we upcycle side streams and waste streams so that they gain value in both a nutritional and economic sense," says Gavarini. It is only the lignocellulosic parts of the raw materials – those that are not edible or have no nutritional value – that are used for energy recovery.

Other side streams that are richer in nutrients or better tasting are reused as food. For example, in one of their most recent projects, residues from pasta production are made into high-quality, nutritious, gluten-free pet food on a Bühler extruder. "The resulting product is loved both by our four-legged friends and their owners," says Gavarini.

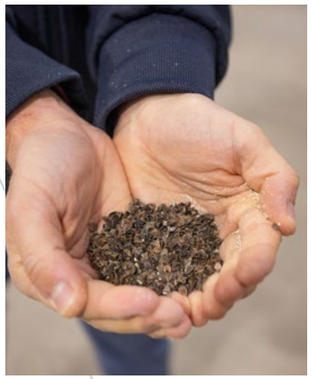
Optimizing water use

It is not just the use of energy, but also water that Andriani optimizes. The water used to clean the dye plates in the pasta plant is filtered and used to grow spirulina in an on-site production facility run by the company's subsidiary ApuliaKundi. The dark green algae is full of vitamins, minerals, antioxidants, and protein, and is used to make supplements, healthy snacks, and cosmetics.

At Andriani, in a perfect example of closing the circle, spirulina is also used as a valuable ingredient in their pasta. The sustainability benefits do not end there: the algae also captures about 1.8 kilograms of CO_2 from the atmosphere per kilogram of spirulina produced. Optimizing the use of water is also important in a region that is prone to drought. This shows that Andriani's idea of sustainability is not just about their own processes but about their entire ecosystem. It combines food traceability and safety, promotion of the local economy, and wellbeing of people, all of which are linked with respect for biodiversity and responsible agriculture. For this reason, Andriani set up a subsidiary, Terre Bradaniche, to develop a sustainable Italian supply chain for pulse production and help local farmers optimize their crops and implement sustainable criteria.

Residues from pasta production are made into high-quality, nutritious, gluten-free pet food using a Bühler extruder.

Buckwheat hulls (below) are not discarded but mixed with cuttings and other wood by-products to produce thermal energy for the plant in the Vyncke biomass boiler (right).



Water from the pasta plant is used to grow spirulina on site. In a perfect example of closing the circle, the spirulina is then used as a valuable ingredient in the pasta.

"Our agronomists work directly with the farmers to ensure that the raw materials we receive meet our exact requirements," explains Gavarini. Here, the raw material is pre-cleaned, weighed, and checked before it is sent to the multigrain mill. The cleaner machine, optical sorter, destoner, and scales are all from Bühler.

The partnership with Bühler also enables Andriani to collect primary data and track all impacts, all the way back to the field. By working with Bühler's partner xFarm, Andriani can trace, monitor, and analyze data relating to the crops and help the farmers to increase yields and efficiency.

Near carbon neutrality

The next step, which they are already working on with Bühler's Environmental Impact Services, is to put all inputs from the crop to the factory output into one system so that they can calculate the impact of their products and identify key environmental footprint reduction levers. This requires full digitalization – a big challenge, but one that they see as essential, as it will enable even greater transparency and enhanced, fact-based decision-making, and increase operational efficiency while significantly lowering the overall environmental footprint.

As a result of all these efforts, Andriani is now close to being carbon neutral within its own boundaries, Scopes 1 and 2. But its ultimate aim is far wider.

Circular economy and sustainability are now key drivers of Andriani's business, not just because these make the company more efficient and enable it to use resources in the optimum way, but also because they help them meet changing demands and position themselves in the market.

The push and the pull

"Every year, we feel more and more pull and push from both sides of our value chain for the thoughtful implementation of sustainability practices in our business and the products we sell," explains Michele Andriani. "Our customers and our suppliers increasingly want to know what our impact is on the planet and on people."

Even more impressively, Andriani has built all of this while they grew, winning in their markets at the same time as creating and expanding their sustainable model through their value chain.

"Sustainability is not just a set of goals, but a way of acting and doing business. We learn from people who choose our products, and that is why we want change, inspiring the entire value chain towards goodwill and excellence," says Michele Andriani. "We are fortunate in having a business partner like Bühler, with whom we share the same values. It is precisely through the exchange of knowledge from our two ecosystems that ideas take shape and together we prepare for the future."

Andriani has seven Bühler pasta lines, capable of producing over 20 different shapes of pasta and ensuring food safety, quality, and efficiency.

Giuseppe Mancini, Plant Operations Manager, and Angela Amendolara, Quality Manager, at Andriani ensure efficient processing and high product quality.

VIDEO

Watch this video to learn more about how Bühler supports Andriani.

INFO

ANDRIANI
Leading the Food Transition

Andriani S.p.A.

Gravina in Puglia, Italy

- Founded in 2009.
- Andriani produces 40,000 tonnes of pasta a year.
- The company serves customers in over 50 countries.
- Andriani uses a range of Bühler solutions, including receiving, cleaning, pearling, multigrain milling, extrusion, and mixing. It has Polymatik presses for gluten-free applications, Eco-thermatik dryers for long goods and C-Line dryers for short goods. It works closely with Bühler's Environmental Impact Services.

"WHAT BROUGHT US TOGETHER WAS ANDRIANI'S VISION TO TRANSFORM ANY SIDE STREAM OR WASTE STREAM FROM ITS PASTA PRODUCTION INTO SOMETHING VALUABLE AND HEALTHY FOR PEOPLE AND THE PLANET."

GIULIA MANZOLINI
Team Manager for Environmental Quantification at Bühler

Smallholders produce around 40 percent of the world's palm oil, but many struggle with low productivity and economic challenges, increasing the risk of deforestation. AAK addresses these root causes by supporting smallholders with training and resources to adopt sustainable practices, aligning with their biodiversity goals.

AAK

A HOLISTIC APPROACH BEARS FRUIT

TEXT: BIANCA RICHLE
PHOTOS: AAK

Oils and fats play a crucial role not only in enhancing the taste of food but also in delivering essential nutrition for both people and animals. However, meeting rising demand sustainably presents many challenges. To address this, Bühler has partnered with AAK, a plant-based multi-oil ingredient house from Sweden that is leading the way with innovative solutions and a holistic approach.

OILS AND FATS are not just carriers of flavors that make food taste good, they are also an extremely efficient energy source and vital for health. They provide the body with essential fatty acids that it cannot produce itself but are necessary for important functions such as nervous system activity and inflammation regulation.

According to the World Health Organization (WHO), around 25 to 30 percent of daily calorie intake should come from oils and fats. While some countries face issues of overconsumption, many heavily populated nations still fall short of these levels. A study published in The Lancet in 2021 estimates that by 2050, global demand for fats and oils for human nutrition is projected to rise significantly due to population growth, economic development, and dietary shifts. To meet worldwide nutritional recommendations, an extra 88 to 139 million tonnes of dietary fats per year will be needed by 2050 compared to 2018.

Oil crops such as palm, soy, coconut, shea, sunflower, and rapeseed play a vital role. According to the USDA Oil Crops Yearbook, nearly 80 percent of fats produced for human consumption come from oil crops, with current global production at around 208 million tonnes. The remaining fat production comes from animal sources, standing at about 60 million tonnes.

Palm oil is a very efficient crop, producing more oil per land area than any other vegetable oil crop. When sourced in a deforestation-free manner, it can be part of a holistic approach to sustainable agriculture.

Interlinking challenges

One big challenge in increasing the production of dietary fats, if not managed properly, is the impact this can have on the environment. The production of fats and oils from animals and plants already accounts for 7 percent of global greenhouse gas emissions. Increasing the production of animal fat is not a solution, as livestock are a well-known contributor to global warming. Increasing the production of oil crops is also complicated. In some areas of the world, it has led to deforestation. In addition, there is already competition for oil crops as they are not only used for food but also in increasing demand for producing biofuels.

"If we want a sustainable solution, we need a holistic approach," says Johan Westman, CEO of AAK, a specialist in plant-based oils and fats. "With technologies such as solar power, we could redirect plant oils currently used for biofuels toward nutrition by 2050." By including these, as well as increasing yields from existing plantations and maintaining the present level of animal fats, Westman believes we could meet the global need for fats and oils with no further deforestation.

Westman, a visionary leader who joined AAK in 2018, has contributed to the transformation of the company from a more traditional plant-based oil manufacturer into an innovative ingredients leader with a strong focus on sustainability, while also improving the financials of the company.

"You need to focus if you want to succeed," he says. "You can't do everything at once." That's why AAK has committed to the ambitious goal of transi-

JOHAN WESTMAN

Johan Westman is President and CEO of AAK, a global leader in specialized plant-based oils and fats. With over 20 years of international leadership experience, he has held senior roles in the automotive and industrial sectors. He holds an MSc in Industrial Engineering and Management and serves on the boards of Absolent Air Group and Thule Group.

"IF WE WANT TO ACHIEVE THE TRANSFORMATION TOWARD A SUSTAINABLE FOOD SYSTEM, WE MUST PROVIDE SOLUTIONS THAT ARE TASTY, NUTRITIOUS, SUSTAINABLE, AND AFFORDABLE."

JOHAN WESTMAN
CEO of AAK

AAK co-develops tailored solutions with its customers in 16 innovation centers around the world.

With an individual approach, better sensory, sustainability, and health profiles can be achieved. Functionality and quality can also be improved.

tioning to 100 percent deforestation-free palm oil by 2025. Their share has increased from 20 percent in 2019 to 91 percent today, and the commitment is driving the business, too. "This dedication to sustainability has not only won us the trust of our customers, but also boosted employee engagement. My colleagues are really proud to work for AAK, making it easier to retain and attract talent."

Palm oil as part of the solution

When talking about the need for a holistic approach, Westman also highlights the importance of considering the impact of switching from one fat or oil source to another. Although the palm oil industry has faced – and continues to face – criticism for its role in deforestation, simply replacing palm oil with another type of oil crop is not necessarily the right solution.

This is because palm oil is in fact a very efficient crop, producing more oil per land area than any other equivalent vegetable oil crop. According to the nature and environmental protection organization the World Wildlife Fund (WWF), palm oil supplies 40 percent of the world's vegetable oil demand globally on just under 6 percent of the land used to produce all vegetable oils. To get the same amount from alternatives, such as soybean, coconut, or sunflower oil, would require four to 10 times more land. The WWF argues on their website that this would merely shift the problem to different regions instead.

A better alternative is to move to sustainable palm oil, which is where AAK's goal of transitioning to 100 percent deforestation-free palm oil comes in.

As a relatively small but specialized player in the edible oil industry, AAK sees itself as a catalyst for change, paving the path for larger companies to follow suit. This is often best achieved through collaboration, and AAK excels at developing customized solutions in close collaboration with its clients.

A good example of this is Bühler's collaboration with AAK in the chocolate production area, where a growing shortage of cocoa and rising cocoa butter prices have created challenges for the industry. Since Bühler itself only has a marginal presence in the oil sector, it relies on partnerships with forward-looking companies like AAK to provide the best possible solutions for its customers. AAK offers Bühler's customers promising approaches for replacing cocoa butter with plant-based oils and fats, always with a focus on the full picture.

"If we want to achieve the transformation toward a sustainable food system, we must provide solutions that are tasty, nutritious, sustainable, and affordable," says Westman.

Co-creating innovations for the future

AAK and Bühler are united by a shared commitment to innovation and collaboration, continually expanding their networks to drive progress. In autumn 2024, both companies participated in launching the Next Generation Pet Food Program pilot, an initiative driven by Big Idea Ventures – a global leader in food-tech, agri-tech, and materials science investment – with Mars Petcare. This pilot was established to foster innovation in pet food and to engage with the start-up ecosystem in developing more sustainable solutions.

The program sought start-ups working on sustainable proteins and fats that support pathways to reducing carbon emissions in pet food production. This included novel ingredients and cutting-edge processing technologies, such as upcycling food waste and advanced extraction methods. In this initiative, Bühler and AAK took on mentorship roles.

Both companies are also members of MISTA, a global innovation platform designed to accelerate the transformation of the food system to meet future needs. "We have joined both the Pet Food Program and MISTA to form partnerships and accelerate innovation. This has already produced remarkable results, such as showcasing breakthrough technologies and facilitating the creation of more sustainable foods in collaboration with consumer goods companies, ingredient suppliers, equipment providers, and start-ups – the new thinkers of our industry," says Westman. "To sustainably feed the world's population by 2050, we need to broaden our collaborations even further, reaching across industries and sectors."

INFO

AAK

Malmö, Sweden

- Roots dating back to 1871.
- AAK produces specialty plant-based oils and fats as ingredients for food and feed, as well as plant-based alternatives for non-food applications to replace fossil-based solutions.
- AAK co-develops with 4,000 customers across a range of sectors including chocolate and confectionery, bakery, plant-based and new food solutions, feed and fish feed, personal care, and technical products.

Partners in Food Solutions

A WINDOW OF OPPORTUNITY

TEXT: JANET ANDERSON
PHOTOS: PARTNERS IN FOOD SOLUTIONS

The African continent could be the breadbasket of the world, yet currently it imports more food than it exports. Partners in Food Solutions brings together volunteer experts from global food and food processing companies with promising companies on the African continent to help them scale their businesses. The partnership works in two directions: it is a window through which both sides find opportunities.

Mandla Nkomo says there is a strong business case for supporting food processing companies in Africa. It drives entrepreneurship and provides insights and opportunities for both sides.

GREAT BUSINESS IDEAS are often sparked through contact with a new person, culture, or environment. When Ugandan couple Erina and Joel Guma were living and working in the UK, they came across a product they had not seen at home – pasteurized liquid eggs. They thought the product might work back in Uganda, where egg production was growing fast, so they took their savings and moved back home to set up a business, Pristine Foods, to produce it. The first year was understandably tough. They had the equipment, but they struggled to extend their product's shelf life beyond 2 weeks. This was not long enough for their customers, mostly catering businesses and bakeries.

To tackle the challenge, Pristine Foods reached out to Partners in Food Solutions (PFS). PFS is an independent nonprofit organization that works to strengthen food security, improve nutrition, and increase economic development across Africa. They link corporate volunteers from global companies in the food and food processing industries with promising businesses in Africa.

PFS put Pristine Foods in touch with Hector Peña, Sales Manager at Bühler Mexico. In weekly calls over a couple of years he mentored the management team, helping them with a wide range of skills in leadership, public relations, production, and project execution. Today, Pristine Foods has not only extended the shelf life of its products; it has also ultimately expanded into the export market, grown its business seven-fold, added mayonnaise to its portfolio, and now has more than three times as many full-time employees.

"This is a great example that demonstrates how PFS works," explains Mandla Nkomo, CEO of PFS. "Hector Peña is a seasoned executive at Bühler, working in a complicated market. He was able to use his experience to help Pristine Foods navigate complex scenarios."

PFS sees its job as identifying such opportunities and facilitating them. "We are building a technology superhighway between the global North and the countries on the African continent," says Nkomo. Companies like Bühler, General Mills, and Cargill, who are at the cutting edge of food processing, support PFS because they see the opportunity for food technology transfer into the fastest growing continent on the planet. On the other side, PFS selects African food processors who recognize the opportunity and are willing to learn and to deploy technology to grow their businesses.

> ***"THE KEY TO FOOD SECURITY IS NOT JUST GROWING MORE FOOD, IT IS ALSO ABOUT ACCESS. THIS IS WHY FOOD PROCESSORS ON THE AFRICAN CONTINENT ARE SO IMPORTANT."***
>
> **MANDLA NKOMO**
> CEO of Partners in Food Solutions

Hubs for a bigger impact

The organization currently operates in 11 countries on the African continent, developing regional hubs with a critical mass of companies that can benefit. "We look at a whole region's food system so that our impact can be bigger," says Nkomo. To date, PFS has helped nearly 2,500 companies.

The majority of PFS's clients process staple products like maize, wheat, rice, and vegetables. These companies seek support in a number of areas. The most common request is for support in food safety and quality: how to build reliable, effective, credible food safety systems within their process infrastructure, to obtain the necessary certifications, and to deliver safe food to consumers. The next biggest areas are new product development and business strategy. "We look for companies with the potential to scale," says Nkomo.

Also vital is equipment consultation and process engineering, two areas where Bühler's expertise comes to the fore and Bühler volunteers can provide world-leading support. "Figuring out new processes, new lines, and line extensions is complicated. The wrong advice can be an expensive mistake if you pay for equipment you cannot use. Our volunteers help

Mandla Nkomo meets Joel and Erina Guma, founders of Pristine Foods in Uganda, one of the promising businesses that has received support from PFS to achieve its aims.

INFO

PARTNERS IN FOOD SOLUTIONS

Partners in Food Solutions

Impact and reach:

- Working in 11 African countries.
- 2,301 volunteers from global food and food processing companies.
- 2,417 clients in Africa assisted or trained.
- 111 billion safe, nutritious, and affordable meal servings.
- 1.8 million smallholder farmers in the supply chain.

these businesses to choose equipment that is fit for purpose and helps them to scale," says Nkomo. Equally important is mentorship. The average age of employees at PFS's client companies is 25. PFS gives these young people access to a global pool of experienced professionals, like Peña at Bühler.

The irony is that the countries of the African continent have the potential to produce more than enough food for their growing populations, and yet they still spend large amounts on food imports – in 2023 more than USD 83 billion, according to the Food and Agriculture Organization of the United Nations. Mostly these imports are staples such as wheat, corn, and rice. North and East Africa is able to produce enough of their own wheat. Nkomo, who previously worked for CGIAR (the Consultative Group on International Agricultural Research), a global research partnership for food security, says there are numerous reasons for the shortfall. One of these is low yields, which are caused by a number of factors such as time of planting, plant population, and post-harvest losses. This could be solved by providing good agronomy support to farmers.

Increasing access to food

The solutions are there, but there is still a challenge. Only a few countries on the African continent are technically classified as "food secure", meaning that they produce more calories than what is known of their demand. But this does not give the complete picture. South Africa, for example, is one of the countries that is deemed food secure, yet it is still the case that 25 percent of its population goes to bed hungry every day.

"The key to food security is not just growing more food, it is also about access," says Nkomo. "This is why food processors on the African continent are so important. They turn raw corn or rice into a product that is nutritious, safe, affordable, and available for consumers." PFS sees its role as priming the pump – getting the food processing sector ready to respond effectively as yields increase, thereby ensuring that the raw materials produced end up as food on people's plates. Nkomo sees huge opportunities at every level. "If you look at the portfolio of foods in Africa, including what we call forgotten or local grains, you realize we are not even scratching the surface of the potential," he says. "For example, there is a great opportunity in developing the value chains for sorghum or for fonio, a grain which is very important in West Africa and highly nutritious."

Africa is the only continent that will still have a growing population at the turn of the century. It also has the most fertile land. Nkomo believes that the continent could, in future, step up and become the breadbasket for the world, providing for other regions that suffer shortfalls due to climate change. "With the right investments and policies, Africa can not only respond to the local market opportunity but also be ready to be a global food supplier," he says.

Opportunities for impact

For volunteers, providing support to one of PFS's client companies is a chance to use their knowledge to have a meaningful impact on food security. For the companies that support PFS, like Bühler, it is an invaluable opportunity to gain access and insights into what is happening in the African business space.

Last but by no means least, there is clearly a wider beneficial impact for consumers and the market. "We have an impact in value chains both upstream and downstream. For example, when our client companies build stable and growing businesses, they are able to procure more from farmers. About 1.8 million farmers are impacted because of the sourcing decisions our clients make," explains Nkomo. "On the consumer side, our clients are making billions of safer, more nutritious, and affordable meal servings available in their markets. That is massive."

With significant changes underway in how development is financed in Africa, the role of the private sector has become even more important.

"If the private sector in Africa grows, particularly in food processing and agriculture, we will have enough creativity and entrepreneurship to resolve the challenges even without massive funding from other governments," explains Nkomo. "There is a business case for this. When a volunteer invests a few hours to support one of our clients, this translates into business growth, into procurement from farmers, and into consumers receiving safe, affordable, and nutritious food. I genuinely believe we have a shot at creating the largest private sector platform on the African continent of food processors that are well-connected to the global North and are therefore able to rapidly transform and respond to the challenges Africa faces."

"WITH THE RIGHT INVESTMENTS AND POLICIES, AFRICA CAN NOT ONLY RESPOND TO THE LOCAL MARKET OPPORTUNITY BUT ALSO BE READY TO BE A GLOBAL FOOD SUPPLIER."

MANDLA NKOMO
CEO of Partners in Food Solutions

MANDLA NKOMO

Mandla Nkomo is the CEO of Partners in Food Solutions (PFS), an independent non-profit organization that works to strengthen food security, improve nutrition, and increase economic development across Africa by linking corporate volunteers from global food and food processing companies with promising businesses in Africa. Nkomo was born in Zimbabwe and has had a career spanning 25 years in the African agri-food sector. Before taking up his role at PFS in July 2024, he served in a variety of roles in international organizations and the private sector, including Chief Growth Officer for CGIAR's Excellence in Agronomy Initiative.

Photo: The Valley

The Cultured Hub

CULTIVATING TOMORROW'S FOOD

TEXT: DALEN JACOMINO

Innovative efforts to shape the future of food have gained a heavyweight player. In December 2024, The Cultured Hub, a joint venture between Bühler, Givaudan, and Migros, was inaugurated in Kemptthal, Switzerland. This research and scale-up center is designed to support start-ups and established companies, transforming the food industry by accelerating the development and market penetration of cellular agriculture products.

The state-of-the-art biotech facility plays a crucial role in the global movement for healthier, more sustainable, and secure food systems.

SCIENCE AND TECHNOLOGY play a pivotal role in transforming the food industry, improving food safety, nutritional quality, and sustainability. Research efforts in laboratories around the world are now rapidly translating into commercial food products at an unprecedented pace. The Cultured Hub is actively contributing to this transformation, with a clear mission: to support both start-ups and established companies in developing market-ready products, accelerating the path toward sustainable, healthy, and affordable food for all.

The Hub, which opened its doors in December 2024, offers a unique scale-up and growth service designed to help companies of all sizes advance their cultivated food processes. Through the Hub's technology, companies can develop a diverse range of products, such as meat, fish, dairy, pet food, and plant-based cells like cocoa and coffee, as well as materials such as leather, cosmetics, and selective pharmaceutical applications.

Sustainable, ethical, and efficient

Cellular agriculture involves producing animal-based foods and other products directly from animal cells. Originally pioneered in Europe and now utilized by over 100 companies worldwide, this technology enables the production of meat, fish, or dairy products grown in a controlled environment.

The production process relies on "cell culture technology", which has been used in Europe for decades. For example, it has been used for growing yeast in bread baking or producing rennet for cheese. Starting with a small sample of animal cells, these are cultivated in a nutrient-rich medium, allowing the cells to grow and differentiate into muscle, fat, or other tissues, ultimately forming animal products.

Cultivated meat and other cellular agriculture products have the potential to dramatically reduce the environmental impact of food production, reduce the need for animal slaughter, and mitigate foodborne diseases, all while conserving water, land, and other resources. With the recent rise in prices of key commodities, such as cocoa and coffee, the ability to diversify processes and scale these products is becoming increasingly important.

Saving time and money

The Cultured Hub covers an area of 1,600 square meters and can accommodate three companies working simultaneously, fostering an environment of collaboration and innovation. It features multiple production areas, an analytics suite, downstream processing systems for developing the finished product, a kitchen, and office space for start-ups. The Hub supports production from small-scale setups, like shake flasks, to 1,000-liter pilot operations, all without the burden of high investment in infrastructure or sacrificing valuable equity. This unparalleled capability bridges the critical gap between research and commercial production, enabling businesses to bring market-ready products to life more efficiently and affordably.

By removing the barriers to large-scale production, companies can bring their innovations to market up to three years faster and at a fraction of the cost. This in turn, accelerates the transition toward a more sustainable and equitable food system.

"The opening of The Cultured Hub is a pivotal moment in the cellular agriculture and cultivated food industry. By offering scalable infrastructure for the development of sustainable food solutions, the Hub is addressing some of the most urgent challenges faced by global food systems, including environmental sustainability and food security," says Yannick Jones, CEO of The Cultured Hub.

INFO

THE CULTURED HUB

The Cultured Hub

Kemptthal, Zurich, Switzerland

Inaugurated in December 2024.

The Cultured Hub, a joint venture between Bühler, Givaudan, and Migros, is a pioneering scale-up and growth service facility dedicated to the cultivated food industry.

Equipped with a product development lab and cell culture and fermentation capabilities, The Cultured Hub enables companies to scale up from small-scale laboratory experiments (shake flask) to 1,000-liter pilot operations without the need for massive capital expenditures on building their own infrastructure.

"BY OFFERING SCALABLE INFRA-STRUCTURE FOR THE DEVELOPMENT OF SUSTAINABLE FOOD SOLUTIONS, THE CULTURED HUB IS ADDRESSING SOME OF THE MOST URGENT CHALLENGES FACED BY GLOBAL FOOD SYSTEMS."

YANNICK JONES
CEO of The Cultured Hub

In addition to state-of-the-art cell culture and fermentation equipment, customers benefit from access to a diverse ecosystem of partners and the deep-rooted industry expertise of the three companies behind this pioneering joint venture: Bühler, Givaudan, and Migros. Each organization contributes with its own unique know-how and strengths.

Bühler brings its extensive knowledge in food processing and equipment to the table, enabling companies to scale up their production processes smoothly. Givaudan, a global leader in flavor and taste, ensures that these new, sustainable products not only meet the growing demand for more sustainable food but also deliver the same great taste consumers expect. Migros, with its deep understanding of retail and consumer needs, helps bridge the gap between innovation and market adoption, ensuring these products reach consumers at the right time and price.

With more than 30 start-ups and established companies expressing interest in the facility, the center is hitting the ground running. The facility is designed to host up to 50 companies annually, accommodating short- and long-term projects and providing room for expansion as the industry grows.

Consistent execution is key

In a world filled with uncertainties, where the demands for food security and environmental responsibility are rapidly increasing, The Cultured Hub, together with its network of start-ups, established companies, and academic partners, can lead to tangible results. By meeting consumer needs, ensuring business efficiency, and addressing both environmental and ethical concerns, the Hub embodies the power of consistent execution. After all, it is not about having the perfect idea but about having a good idea and executing it consistently.

Maestrani

SWEET SUCCESS

POWERED BY DATA

TEXT: MICHÈLE BODMER
PHOTOS: JEKATERINA GLUZMAN

For over 170 years, Maestrani Schweizer Schokoladen AG has been delighting consumers worldwide with its chocolates. Striving to reach new heights of innovation and excellence, the company has embraced a data-driven strategy to enhance transparency and elevate product quality. Their digital transformation has already delivered an impressive 18 percent boost in efficiency – laying the groundwork for an even sweeter future.

SET AMONG THE ROLLING HILLS and meadows of Flawil, Switzerland, you'll find Maestrani's production facility, including its "Chocolarium World of Discovery". This highly immersive chocolate experience is designed to delight the 230,000 visitors who come here every year as they discover how Maestrani puts happiness into every chocolate it makes. And behind this sensory experience is the company's factory, where over 4,500 tonnes of chocolate are produced annually for its flagship brands Minor, Munz, and Maestrani.

As a key player in the world of Swiss chocolate, the family-owned company has clearly earned a place in the hearts of chocolate lovers everywhere but, true to its purpose, Maestrani is dedicated to taking its success to the next level. Working with its close neighbor, Bühler, it has leveraged the full potential of digitalization with a smart chocolate line that has already improved efficiency by 18 percent and changed the way it approaches operational challenges and problem-solving.

"Our history is built on family values, innovation, and the drive to constantly improve," says Christoph Birchler, CEO of Maestrani. "We see enormous potential in the chocolate market. To consistently offer the high-quality products that our consumers have come to love and trust, we need to be faster, more adaptable, and ready for future challenges."

Embracing digitalization

Central to achieving this vision is Maestrani's move to embracing digitalization to create a more transparent and data-driven production process. "Before we started our journey, our production processes relied heavily on operator experience. We knew what we needed to achieve but lacked the data to fully understand how to improve or locate inefficiencies," explains Carsten Engelhardt, Technical Director at Maestrani.

This realization prompted Maestrani to take its first steps toward digital transformation in 2016. With Bühler, the company began implementing analytical tools designed to bring greater transparency to its production processes. The journey kicked off with the installation of intelligent sensors, which allowed Maestrani to control processes in real-time and collect actionable data. This data was then transferred to Bühler Insights – a platform that aggregates and analyzes data from multiple sources, including sensors, machine controls, and offline data – where it could be visualized and analyzed. The first step involved modernizing older control systems to enable seamless data flow. Bühler Insights, which is designed to replace guesswork with actionable insights, enabled Maestrani to enhance efficiency, quality, and flexibility while maintaining its hallmark craftsmanship. By digitizing key workflows and creating a more connected factory, Maestrani laid the foundation for data-informed decision-making and continuous improvement. "Once we had the data, we were excited to see what we could do with it," says Engelhardt. Together, the Maestrani and Bühler team analyzed the information and discovered a key bottleneck in the process that was causing suboptimal grinding in the five-roll mill.

"For the first time, we had gained real insights into our operations," explains Engelhardt. By utilizing Bühler Insights, the inefficiency was quantified, and different scenarios were simulated to test potential improvements.

Maestrani's Chocolarium – where Swiss chocolate magic meets innovation. A place where tradition, craftsmanship, and cutting-edge technology come together to create sweet experiences for visitors and chocolate lovers alike.

"THIS TRANSPARENCY AND DATA-DRIVEN APPROACH HAS POSITIONED US TO NOT ONLY MEET CURRENT MARKET DEMANDS BUT TO ADAPT AND THRIVE IN THE FUTURE."

CHRISTOPH BIRCHLER
CEO of Maestrani

With Bühler's market-leading conching solutions, including the ELK S and DÜC S, Maestrani achieves the exact rheology properties it requires and the perfect flavor and texture for its finished chocolates.

With the data from Bühler Insights, Maestrani has replaced guesswork with actionable insights, achieving nearly 20 percent efficiency improvement. From left to right: Patrik Keller, Fabian Dintheer, and Carsten Engelhardt.

"With this data-informed approach, we identified adjustments and made targeted interventions that boosted production efficiency," explains Sudhir Punyamurthula, Data Analyst at Bühler. "We knew there was potential for gains, but what has been achieved so far is a big leap forward."

One targeted intervention involved installing a new conveyor belt to empty the mixer faster, which optimized the five-roll mill's operation. "By working with the data from Bühler Insights, we transitioned from relying solely on operator experience to making data-supported decisions that significantly enhanced our production efficiency," explains Patrik Keller, Head of Production & Logistics at Maestrani.

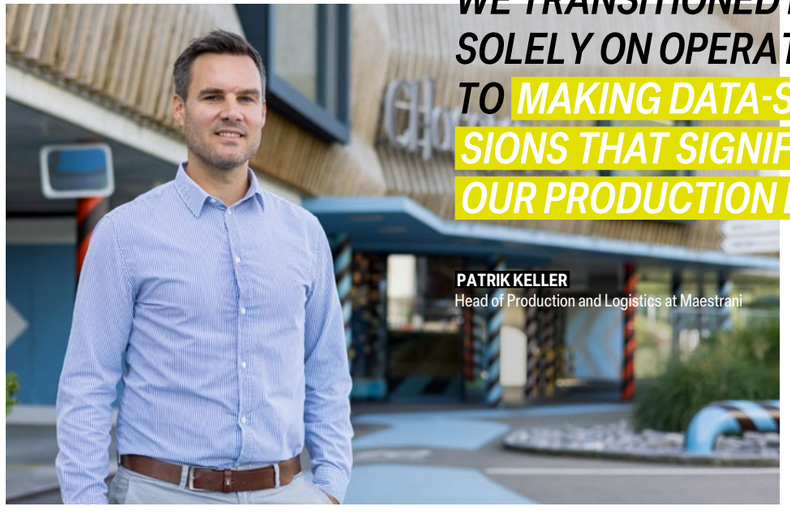
Unlocking gains

This was a turning point for Maestrani. "Before, we had a feeling that things could run more smoothly, but it was difficult to pinpoint the exact issues," says Engelhardt. "Thanks to Bühler Insights and the support we received from Bühler's experts, we were not only able to visualize and quantify these inefficiencies, but we were also able to interpret the data, define exactly where changes were needed and find solutions together. Our efficiency improved by nearly 20 percent. This gain is truly a game-changer – not just for efficiency but for how we approach problem-solving."

Beyond efficiency, Maestrani sees the smart line as the future of chocolate production. "When we consider our vision for a smart factory, it's about combining machine intelligence, personnel, and seamless data flow to ensure production optimization," says Engelhardt. The next moves will include expanding traceability, optimizing conching, and automating mass production, all with minimal manual intervention. Their decision to integrate the smart chocolate line also addresses a critical challenge: the increasing difficulty in finding skilled personnel. "The ability to use insights from the data to guide operators, rather than relying solely on their expertise, is pivotal," says Engelhardt. "We need systems that optimize processes and also make it easier for our teams to focus on higher-value tasks."

The collaboration between Maestrani and Bühler has played a pivotal role in enabling this transition. Bühler's expertise in digitalization and process optimization provided Maestrani with the tools and insights needed to begin its smart factory journey. "When Bühler first started exploring digitalization, Maestrani was an ideal partner because of their proximity and openness to innovation," says Fabian Dintheer, Digital Program Manager at Bühler. "We initially worked together to test sensor systems and gather data in real production conditions, unlocking the potential for greater transparency."

The project was spearheaded with the use of data analytics, interpreting detailed data with advanced simulation models together with process experts from Maestrani. "This approach allowed us to pinpoint key process improvements, such as analyzing stoppages, faults, maintenance issues, downtimes, and cleaning times," Dintheer says. "Comprehensive data collection was crucial for this analysis."



"WITH DATA FROM BÜHLER INSIGHTS, WE TRANSITIONED FROM RELYING SOLELY ON OPERATOR EXPERIENCE TO MAKING DATA-SUPPORTED DECISIONS THAT SIGNIFICANTLY ENHANCED OUR PRODUCTION EFFICIENCY."

PATRIK KELLER
Head of Production and Logistics at Maestrani

The integration of Bühler Insights has already reduced manual interventions, streamlined production processes, and optimized resource allocation at Maestrani. Operators now have more peace of mind because they can respond instantly to disturbances, reducing downtime and ensuring consistent product quality. The company also handles more orders within the same two-shift production, allowing employees to focus on other high-value tasks.

A partnership for the future

"Our machines now communicate better, providing the feedback we need to prevent disruptions and also improve our recipes. That's what makes this project so valuable: We have achieved progress that is reflected in quality, in financial outcomes, and in the capacities that are freed up," says Keller.

The project has clearly brought tangible results. However, the collaboration between the two companies goes far deeper. "The partnership between Bühler and Maestrani has evolved from its beginnings in 1985 into something unique," says Birchler. "We take pride in serving as a kind of 'real-time lab' for Bühler. This allows Bühler to refine their technologies in real production environments, while we benefit from cutting-edge innovations and practical insights that keep us competitive."

Birchler emphasizes that the company's digital journey is not just about producing more, but about doing so in a smarter and more sustainable way. "This transparency and data-driven approach has positioned us to not only meet current market demands but to adapt and thrive in the future," he explains. "Maestrani may be one of Bühler's smallest customers, but as a direct neighbor, we've become one of their most engaged partners – not just geographically, but strategically."

INFO

Maestrani

Flawil, Switzerland

- Founded in 1852.
- Maestrani produces over 300 different chocolate products and welcomes more than 230,000 vistors a year to its Chocolarium World of Discovery.
- The company supplies customers in Switzerland and exports approximately 35% of its products to around 40 countries worldwide.
- Maestrani has Mixer, PreFiner, Finer, and Conching machines (DÜC S and ELK S), as well as Bühler Insights.

VIDEO

Watch this video to learn more about Maestrani's efficiency gains thanks to Bühler Insights.

"OUR EFFICIENCY IMPROVED BY NEARLY 20 PERCENT. THIS GAIN IS TRULY A GAME-CHANGER – NOT JUST FOR EFFICIENCY BUT FOR HOW WE APPROACH PROBLEM-SOLVING."

CARSTEN ENGELHARDT
Technical Director at Maestrani

Engineered to boost quality, operational flexibility, and efficiency, OptiBake reduces energy consumption by 50 percent compared to conventional gas-fired wafer baking ovens.

Bühler has launched OptiBake, the world's first inductively heated wafer oven and a breakthrough in industrial baking technology. Designed to enhance quality, flexibility, and efficiency, OptiBake cuts energy use by 50 percent compared to gas-fired ovens. It's tailored to flat and hollow wafers and sets a new benchmark in the global confectionery and consumer foods industry, supporting greater efficiency and sustainability.

OptiBake

A SWITCH THAT PAYS DIVIDENDS

TEXT: LUKAS HOFSTETTER

FOOD PRODUCERS WORLDWIDE are facing growing challenges. Rising CO_2 taxes, volatile energy prices, and changing consumer demands are forcing companies to find new ways of producing to remain competitive. The industrial baking sector is feeling the heat even more due to its energy-intense processing. Traditionally, ovens have been powered by gas, which for decades was readily available, relatively inexpensive, and had historically relatively stable pricing. Geopolitical developments paired with the urgency to cut CO_2e emissions, however, have prompted a major rethink within the industry. In close collaboration with its customers, Bühler developed OptiBake to address these issues.

"With OptiBake, we set out to deliver more than just a new oven for flat and hollow wafers. We challenged ourselves to combine exceptional wafer quality with unprecedented flexibility, while enabling customers to contribute to sustainability. Our electric induction heating technology answers the global call for more sustainable industrial practices, offering higher efficiency, consistent high quality, lower

Each baking plate can be controlled individually, ensuring outstanding wafer sheet quality and consistency.

VIDEO Watch the video to find out more about the revolutionary OptiBake technology.

operational costs, and a significantly reduced carbon footprint," says Sandra Lutz, Head of Business Unit Wafer at Bühler. For more than a decade, Bühler's wafer segment has focused on developing technologies that support customers in growing their business while minimizing environmental impact. With OptiBake, the team has introduced a new electric solution that offers a range of advantages over conventional gas-fired wafer ovens. While conventional electric heating has been around for decades, inductive heating uses electricity more efficiently and offers unprecedented possibilities in control.

Its advanced electric induction heating system reduces energy consumption by up to 50 percent, leading to significant cost savings. Because it emits no carbon monoxide (CO) or nitrogen oxides (NOx), OptiBake offers environmental benefits such as improved air quality and reduced greenhouse gas emissions. "These emissions reductions can lead to tax and licensing advantages for our customers, along with increased subsidy opportunities. OptiBake also supports sustainability efforts by significantly lowering carbon footprints, depending on the local electricity mix. By switching from gas to electricity, we're increasing supply security, which addresses a key pain point for many of our customers, especially in Europe," explains Lutz.

The innovative design of OptiBake features individual temperature control for each baking plate, ensuring outstanding wafer sheet quality with precision and consistency. Its operation carries no fire hazard, as there are no open flames in the baking chamber. Lower baking chamber temperatures reduce life-cycle costs by minimizing thermal stress on components, such as cables and bearings. OptiBake also creates a quieter production environment by eliminating burner nozzle flow noise and simplifies heat and water recovery due to the absence of combustion products. The new oven also allows for 100 percent raw material utilization, as baking scraps do not burn and can be repurposed.

"With rising CO_2 taxes, volatile energy prices, and changing consumer demands, companies must act now to stay ahead," says Johannes Greil, Head of Product Management Wafer at Bühler. "OptiBake represents a milestone in industrial baking technology, delivering increased quality, efficiency, and flexibility. This powerful combination equips customers to thrive today and remain competitive in the years to come."

The new oven is quickly earning accolades and has been awarded the Lower Austrian Innovation Award 2025. Out of 80 submissions and nearly 30 projects selected for the final phase, OptiBake stood out and emerged as the overall winner, receiving the Karl Ritter von Ghega Prize. "Earning this award highlights our pioneering innovation but also the dedication, passion, and teamwork that drive our work. A sincere thank you to everyone on the team as well as our network of customers, experts, and academic partners, who were fully engaged in the development process," says Lutz.

"WITH OPTIBAKE, WE CHALLENGED OURSELVES TO COMBINE EXCEPTIONAL WAFER QUALITY WITH UNPRECEDENTED FLEXIBILITY, WHILE ENABLING CUSTOMERS TO CONTRIBUTE TO SUSTAINABILITY."

SANDRA LUTZ
Head of Business Unit Wafer at Bühler Group

OptiBake: Three electric inductors provide precise temperature control for each individual baking plate – no gas burners, zero direct CO_2 emissions.

Loacker, the Italian confectionery company from South Tyrol specializing in wafers, chocolate, and related products, began collaborating with Bühler in 2020 to explore zero-emission wafer production.

Business and values align

"We are now delighted to be Bühler's pilot partner, as this project has been on our minds for years and aligns perfectly with our sustainability strategy and our core values, which have been passed down through generations. As a family-owned company, we are committed to creating a positive social and environmental impact throughout the entire life cycle of our products," says Andreas Loacker, Vice Chairman of the Board.

"Looking ahead, we expect OptiBake to maintain the high quality of our wafers while significantly improving energy efficiency. Our goal is to take a major step towards zero-emissions production, supporting our decarbonization targets. This transition is essential to reducing our environmental footprint and making our baking process more sustainable," explains Markus Valersi, Project Manager Engineering at Loacker.

INFO

The Wafer Innovation Center

As the global market leader in industrial wafer baking systems for the waffle sector, Bühler's wafer business offers comprehensive solutions for flat and hollow wafers, wafer rolls, ice cream cones, soft wafers, wafer snacks, and a wide range of related products. At the Wafer Innovation Center in Leobendorf, Austria, customers can collaborate with Bühler's specialists to try out the OptiBake's new capabilities and explore solutions tailored to their specific needs.

Scan the QR code for more information on OptiBake.

Danco

CAPTURING CHINA'S WAFFLE MARKET

TEXT: BURKHARD BOENDEL
PHOTOS: DANCO

A fusion of ambitious vision and leading technology has enabled Danco to capture China's soft waffle market. By keeping a tight focus on innovation and quality, the Danco brand has become a household name across the country. It is a success story deeply rooted in entrepreneurship and driven by the company's long-term partnership with Bühler.

Danco operates 17 Bühler production lines to deliver 8 million waffles a day to supermarkets across China.

ACROSS CHINA, Danco soft waffles are found in nearly every supermarket and have become a firm favorite with consumers. Today, Danco's success may seem obvious, but 20 years ago, it took a highly visionary move to kickstart it – a move driven by entrepreneurship and focused on technological leadership. At the heart of this success is Cai Tumu, the brand's founder and president, and it is founded is a close, long-term partnership with Bühler.

Cai Tumu's entrepreneurial talents were already evident as early as the 1980s. As China's then-leader, Deng Xiaoping, began driving reform and opening up the economy, Cai Tumu saw opportunities. His first focus was agriculture. With limited capital, a clear vision, and tenacity, he started a feed mill, which he developed into an industry benchmark in the region.

His pursuit of quality and technology enabled Cai Tumu to stand out in the feed industry. While his peers settled for producing products to national standards, he chose to benchmark his products against Japanese standards, deciding to raise the protein content of duck feed from 16 percent to 18 percent. Whereas his rivals relied on traditional pelleting technology, he was the first to introduce steam technology to improve digestibility.

This focus on technology, combined with persistence and the courage to be first, paid off, and his feed mill became the only company in the region to survive. However, Cai Tumu's ambition did not stop there.

In the 1990s, Cai Tumu tried a variety of businesses, from clocks to umbrellas, but none of them worked. "I realized that you can't do everything, but that you should master what you do," Cai Tumu says. Guided by this philosophy and armed with his success in the feed industry, he turned his attention to the more promising food sector. This time, he spotted a gap in China's soft waffle market.

A decisive step in the journey

In 2005, a key meeting took place that laid the groundwork for the new business. Cai Tumu and his team visited ANUGA Food Fair in Cologne, Germany, to get an overview of the market. At the fair, they saw the potential of the soft waffle market and, after delving deeper, decided to enter it. The numbers clearly revealed an opportunity.

According to the China Food Industry Association's "Research Report on the Development of China's Casual Food Industry," in 2005, China's snack food market was worth approximately RMB 255.2 billion. In terms of market segmentation, candies, chocolates, cookies, and pastries dominated, while the baked goods segment was still in its infancy. The snack food industry was at the nascent stage of rapid growth.

"MY MOTTO IS: YOU CAN'T DO EVERYTHING, BUT YOU SHOULD MASTER WHAT YOU DO. MY GOAL IS TO CREATE FLAVORS THAT APPEAL TO CHINESE CONSUMERS."

CAI TUMU
Founder and President of Danco

"We decided at the trade fair to partner with Haas, which was acquired by Bühler in 2019. They were moderately sized with advanced technology and, crucially, they already had a presence in China," explains Cai Tumu. "At that time, Haas had already established a branch in China, which was a significant advantage."

To outside observers, it might have seemed like a straightforward transaction to purchase goods with available funds. However, in China in 2005, there were challenges. Although many foreign companies were eager to enter the Chinese market, communication was a significant obstacle. "I still remember the challenges vividly," says Cai Tumu. "Since Haas had already entered the Chinese market, the communication process with Danco was much smoother." This greatly facilitated the cooperation, and the contract for high-end food production was signed.

Looking back, Andreas Schoch, who has been working with Danco from the beginning and is now Head of Sales for the Wafer business at Bühler, also remembers the importance of this factor. "The fact that Haas already had a branch in China at that time was a huge advantage," Schoch explains. "This meant that Danco could be sure not only that the technology was right, but also that they would have local support."

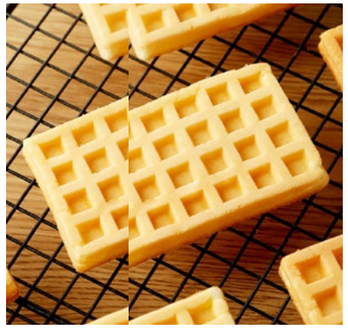
The close relationship between Danco and Bühler remains a decisive success factor to this day – a sentiment shared by Cai Tumu. In 2006, their first waffle production line was delivered and put into operation. Only one year later Danco's soft waffles were introduced to the Chinese market and were an immediate success. The automated line, which produced 30,000 waffles per hour, was the starting pistol for Danco's race to increase capacity. In 2008, they ordered an additional production line. Then, in 2010, two more lines were added, and in 2012, a further two lines as capacity continued to expand. Today, Danco operates 17 Bühler production lines in two locations – the largest soft waffle production base in China and one of the largest in the world.

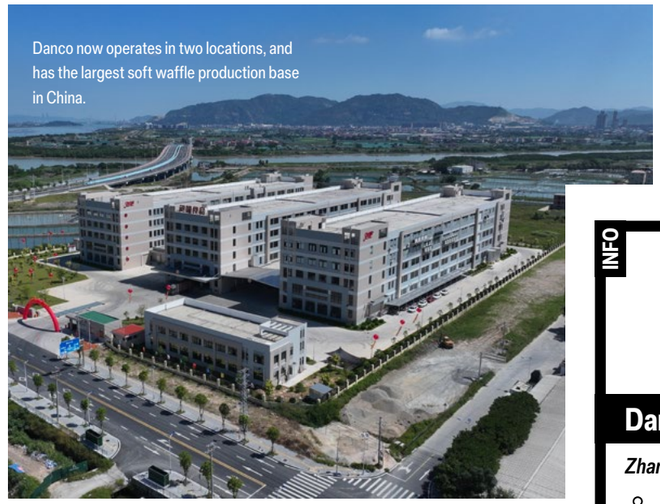
Developing perfect recipes

The production facilities are filled with the enticing aroma of baking butter and eggs. Danco uses on average 32 tonnes of flour and 800,000 eggs per day and delivers 8 million waffles a day to supermarket shelves nationwide. The production lines have to be finely tuned to achieve this. "Each new production line isn't just a simple copy of the others," says Schoch. "Waffles are delicate. They contain eggs and need to be soft, fragrant, and have a long shelf life – that is a challenge for any production line."

Additionally, Danco wanted to create a variety of products with different characteristics to meet market demand and asked Bühler to adjust the technical parameters accordingly. "I wanted to create flavors that appeal to Chinese consumers," explains Cai Tumu. They managed this process step by step. Initially, the product did not meet expectations – it was hard and bland. The research and development team kept tweaking the recipe until they finally achieved a waffle with a Chinese-inspired taste – soft and flavorful.

With Bühler's control system, temperature and humidity are precisely regulated to ensure the best possible taste and appearance of each waffle. The automated control system, together with Bühler's energy-efficient equipment, significantly boosts production efficiency and reduces energy consumption. As well as requiring very precise airflow control, waffles also have to meet high quality and hygiene requirements to ensure a shelf life of several weeks on supermarket shelves. Bühler's advanced process expertise, along with its control and automation technology, plays a pivotal role in Danco's success. Waffle production lines manufactured by Bühler can achieve a pass rate of 98.5 percent, which helps customers like Danco achieve cost savings.





INFO

Danco

Zhangzhou, Fujian, China

- Founded in 1985.
- Danco produces 8 million waffles a day.
- The company serves customers across China.
- Danco uses a range of Bühler solutions, including soft waffle lines and flat wafer lines.

Creating brand value

During the product promotion process, Danco laid great emphasis on international standards and cultural inheritance, clearly demonstrating the high-end quality of its products and showcasing its outstanding ability to successfully transform core technologies into consumer language.

"Bühler is proud to have a customer like Danco," says Xia Haiyang, General Manager of Foods Business at Bühler Greater China. "We have been working with Danco for 20 years, riding the wave of this industry together. Since our cooperation started in the Haas era, we have built up a strong friendship and trust over the years."

In the waffle market, the focus is on health, customization, and the development of technology. Danco brings multi-dimensional brand competitiveness, and Bühler delivers innovative technology. "We hope to jointly develop more products over the next 20 years that meet market demand," explains Xia Haiyang.

Danco has always been committed to quality. It is dedicated to providing consumers with healthy, delicious, and safe products. Danco strictly selects raw materials, controls production processes, and packages products to ensure that every waffle meets high quality standards. This pursuit of quality aligns closely with Bühler's values, forming the foundation of their long-term partnership. With its advanced technology and stable performance, Bühler's equipment provides strong support for Danco's production. Currently, Danco has established a brand value system centered on innovative technology, grounded in quality commitment, and supported by scenario adaptation. Its development path serves as a model for local food companies to transition from product manufacturing to brand building. As its internationalization strategy progresses, this technology-driven and culture-empowered brand is reshaping the global competitiveness of China's snack food industry.

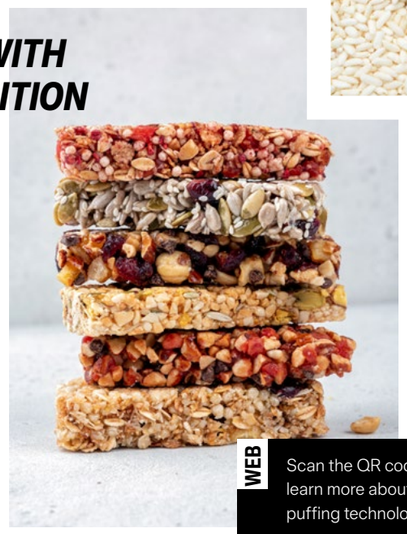
Danco is once again forging ahead. Despite the vast potential of the Chinese market, Cai Tumu is now eager to guide Danco into overseas markets. "We also aim to set standards abroad," he says. His entrepreneurial spirit is as strong as ever. Although Danco has yet to finalize which products will capture which markets, the recipe for success is clear: quality, customer proximity, and innovation.

SPOTLIGHT ON **GRAINS & FOOD**

Our expertise in food and feed processing is based on over 160 years of experience combined with close collaboration with customers around the world. Discover how our drive for innovation and our customer proximity enable us to stay ahead of the curve and deliver best-in-class solutions and services.

Uzwil, Switzerland

BÜHLER EXPANDS PORTFOLIO WITH PUFFING TECHNOLOGY ACQUISITION



WEB Scan the QR code to learn more about the puffing technology.

Bühler has acquired cutting-edge puffing technology from CEREX for food, pet food, and feed applications. This strategic acquisition expands Bühler's product portfolio, offering advanced solutions to meet the growing global demand for healthier, more diverse food products. The versatile technology can be applied to a wide range of items, including snacks, ready-to-eat breakfast cereals, confectionery, dairy products, and bakery goods, providing manufacturers with greater flexibility and innovation potential. Originally developed by Swiss company CEREX, the puffing technology significantly improves grain processing by achieving yields exceeding 95 percent, minimizing waste, and ensuring uniform puffing quality across all grains.

The system is designed for exceptional energy efficiency, consuming 50 percent less power compared to conventional alternatives — operating at just 60 kilowatt-hours (kWh) per 100 kilograms of product, instead of the typical 120 kWh.

Along with its sustainability benefits, the technology delivers a consistent, industrial-grade puffing process that complies with the highest global food safety standards. To help customers leverage this innovation, Bühler opened a Puffing Application Center in Uzwil in June 2025, where they can test new recipes with pulses and grains, develop tailored processes, and gain hands-on experience with the new puffing technology.

VIDEO Watch the video to learn how Bühler integrates NapaRoast's technology.

Uzwil, Switzerland

THE ONE-STOP-SHOP FOR NUT PROCESSING TECHNOLOGY

Bühler has integrated NapaRoast's pasteurization and roasting technology into its offering. With the addition of the NapaRoast steam vacuum pasteurization technology to its broad portfolio, Bühler strengthens its market position in the nut processing industry to cater even better to trends such as healthy snacking, minimal breakage, and sustainable practices.

"The integration of NapaRoast puts us in a unique position to be a one-stop shop for our customers. The best-in-class pasteurization process helps to increase food safety, process efficiency, and traceability in combination with our proven technologies for nuts processing. With the integration of the NapaRoast solution into our portfolio we look forward to sharing the benefits of this technology and serving the NapaRoast customer base – not just for nuts, but for many of the solutions Bühler offers as well," says Cathrin Flühler, Head of Market Segment Nuts at Bühler.

The integration of the technology is a win-win situation for all parties, especially in terms of food safety, energy consumption, and product quality. "Our pasteurization process offers a high pathogen reduction of >5 log (99.999%) in nuts, seeds, and other low moisture foods. During our process, steam is used to raise the surface temperature of the product to kill pathogens effectively," says Dr. Cameon Ivarsson, Co-Founder of NapaRoast. By pasteurizing with saturated steam, the products can be treated effectively at lower temperatures in a vacuum. The high efficiency of saturated steam does not require a drying step, thus protecting the quality, texture, color, and flavor of the product.

Customers benefit from extended shelf life, minimized product loss, and full traceability – crucial for compliance and consumer trust. The system's energy efficiency and gentle handling of bulk quantities make it an ideal choice for producers looking to meet the highest food safety standards while maintaining premium product quality. To underline Bühler's position in nut processing and offer customers a unique chance to test and train along the value chain, the company has upgraded its research and training center in Uzwil. "The pasteurization step is integrated into our state-of-the-art facility, where customers can experience the technology firsthand. We are excited to open the center in August 2025 and invite customers to an exclusive training session on November 4 and 5," says Flühler.

Boguar, Bangladesh

TANVEER FOOD'S NEW RICE MILL TO BOOST FOOD SECURITY

Tanveer Food is expanding its presence in the rice business with plans to establish the most modern and sustainable rice mill in Bangladesh. Located in Bogura, the newly built mill utilizes innovative Bühler technologies, including two parboiling lines with a capacity of 16 tonnes per hour, one aromatic line (8 tonnes per hour), advanced drying systems, packaging machines, and the SORTEX CrystalVision. These solutions enable production of 800 tonnes of rice daily to help meet Bangladesh's annual consumption of 35 million tonnes.

One standout feature is the LEEA drying system, which ensures the collection, processing, and extended storage of wet paddy, maintaining quality and preventing losses even in adverse climates – a key advantage in the Bangladesh rice market.

"We are dedicated to adopting Bühler's technologies that promise higher yields, reduce waste, and lower power consumption. Our goal is to enhance our service to the Bangladesh community, ensuring food security, food safety, and business sustainability," says Emdadul Haque, General Manager of Tanveer Food.

The new Milling Academy is directly connected to the Grain Innovation Center.

MILLING TRAINING *REDEFINED*

TEXT: BIANCA RICHLE

At the heart of Bühler's headquarters in Uzwil, Switzerland, a state-of-the-art 1,800-square-meter training center for millers has opened its doors. The Milling Academy for food and feed underscores the importance of the milling sector for Bühler, bringing together decades of expertise with the latest technology and modern teaching methods. Direct access to the Grain Innovation Center, research and training centers, and the CUBIC innovation campus enables course participants to gain unique hands-on insight into key industry areas.

FROM THE CUSTOMER CENTER, visitors walk through a green, covered courtyard to reach the new Milling Academy for food and feed. And once inside, it's hard not to stop in awe. What awaits is a spacious, light-filled training center with inviting seating alcoves where students are hard at work. A large glass façade offers an open view into the new Grain Innovation Center, which is directly linked to the Milling Academy and also serves as a space for hands-on training. The inviting coffee corner provides a place for students from different courses to meet, exchange ideas, and build connections. Behind the modern classrooms, the machinery hall spans two floors, where experts bring theory to life through practical demonstrations. "The construction of the new Milling Academy gave us the chance to design and implement everything in a way that best supports our customer training programs," explains Dario Grossmann, Head of the Milling Academy. "We also used this opportunity to create more hands-on learning experiences right at the machines."

For Grossmann, didactics is a key pillar of the overall concept. "All of our instructors are experts with many years of experience, but expertise alone isn't enough. To ensure we deliver the best possible learning experience, every one of our trainers has formal training in teaching methods, which they continuously build on and refine."

The first training sessions have already been held at the new Milling Academy, and participant feedback has been overwhelmingly positive. "Participants tell us that the new Milling Academy has taken our training to an entirely new level of quality," explains Grossmann.

One of the first participants was Oliver Efrain Romero Lucero, Continuous Improvement Manager at CMI Alimentos in Guatemala, one of Central America's largest food producers, with expertise in both wheat and corn milling. "The infrastructure and overall concept are outstanding. The welcoming atmosphere allows you to fully immerse yourself in the world of milling during the training. The instructors are highly skilled and training materials are also extremely well prepared. Being located within Bühler's innovation campus also helps deepen your understanding of the company's diverse business and the many interconnected processes," explains Romero.

Jan Tuborg Pedersen, Team Leader at Valsemøllen in Denmark, has also completed training at the new Milling Academy. Valsemøllen is known for its high-quality standards and over 120 years of experience milling local wheat, rye, oats, and pulses. Pedersen recently participated in an oats course and was equally impressed by the new facilities. "I really like that it's bright and modern, with large classrooms and big screens. For me, one of the most important innovations is the addition of a showroom with all the machines we're learning about, and you run into other students in the hallways. The direct connection between the Milling Academy and the Grain Innovation Center is incredibly useful, it gives you the freedom to move around, meet people, and ask questions wherever you go."

At the cutting edge of innovation

All machines in the new Milling Academy are operated without product, allowing participants to observe their inner workings and even open them while running – offering insights that would not be possible during normal production. For those who want to see the equipment in action with real material, the adjoining Grain Innovation Center provides that hands-on experience. Here, participants can test and work with the machines under real processing conditions.

Grossmann emphasizes that training also continues at Bühler's fully automated School Mill, which processes 24 tonnes per day. This facility makes it possible to conduct training on an industrial scale. Conveniently located just a short walk from the CUBIC, it allows participants to make the most of their time during training days.

The Milling Academy's training offering also includes two state-of-the-art laboratories. One is designed specifically for analytical training, and the

With their bright, modern design and large screens, the training rooms offer the perfect environment for theory sessions.

At the Milling Academy, state-of-the-art technology meets modern didactics in an environment designed to encourage collaboration and knowledge-sharing.

Practical experience is a core part of the training approach. Participants work directly on the machines, applying what they have learned under expert supervision, preparing them for real-world tasks.

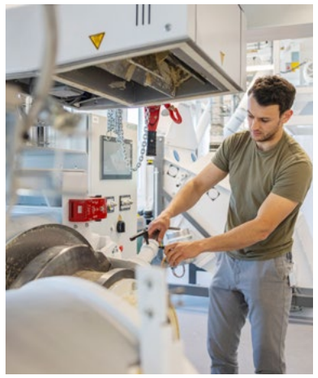
"THE INFRASTRUCTURE AND CONCEPT ARE EXCELLENT. THE WELCOMING ATMOSPHERE ALLOWS YOU TO FULLY IMMERSE YOURSELF IN THE WORLD OF MILLING DURING TRAINING."

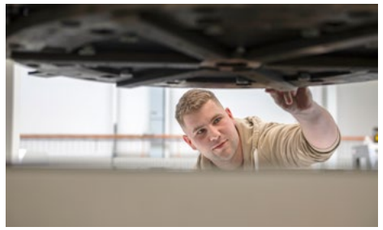
OLIVER EFRAIN ROMERO LUCERO
Manager of Continuous Improvement at CMI Alimentos, Guatemala

With a daily capacity of 24 tonnes, the fully automated training mill offers the opportunity to conduct training at an industrial scale.

"THE CONSTRUCTION OF THE NEW MILLING ACADEMY GAVE US THE CHANCE TO DESIGN AND IMPLEMENT EVERYTHING IN A WAY THAT BEST SUPPORTS OUR CUSTOMER TRAINING PROGRAMS."

DARIO GROSSMANN
Head of the Milling Academy





Julia Wicki (Wicki Mühle AG), Maximilian Schrott (Martin Schrott & Söhne), and Benedikt Hitthaler (A. Rieper AG) are all enthusiastic about the Milling Academy.

other provides a safe environment for electronics education and experimentation. Naturally, digital services are also a key part of the curriculum. Thanks to large interactive screens, participants can test these systems thoroughly in real time.

The Milling Academy offers a comprehensive view of the entire value chain, from raw material intake to final packaging. At the Bühler bagging station within the Academy, participants can witness flour from the trial mill in the Grain Innovation Center being packaged, bringing the process full circle.

WEB Find out more about the training courses offered at the Milling Academy.

Integrating feed milling

The new Milling Academy was designed for millers in both the food and feed industries. As part of that vision, the School of Feed Technology (SFT) has now found its new home within the Academy.

"This new location is ideal for our students," explains Lothar Driller, Head of the SFT. "The fact that they can use the machines in the Grain Innovation Center for their training sessions alongside the Milling Academy is fantastic and opens up valuable opportunities for deeper practical experience."

The range of equipment now available for feed milling training is significantly broader, ensuring that every student can work with machines similar to those used in their own facilities. "With this new site, we're leveraging synergies and exchanging knowledge across disciplines," Driller explains. "Our students also benefit greatly from the proximity to other research and training centers, such as extrusion, proteins, and more."

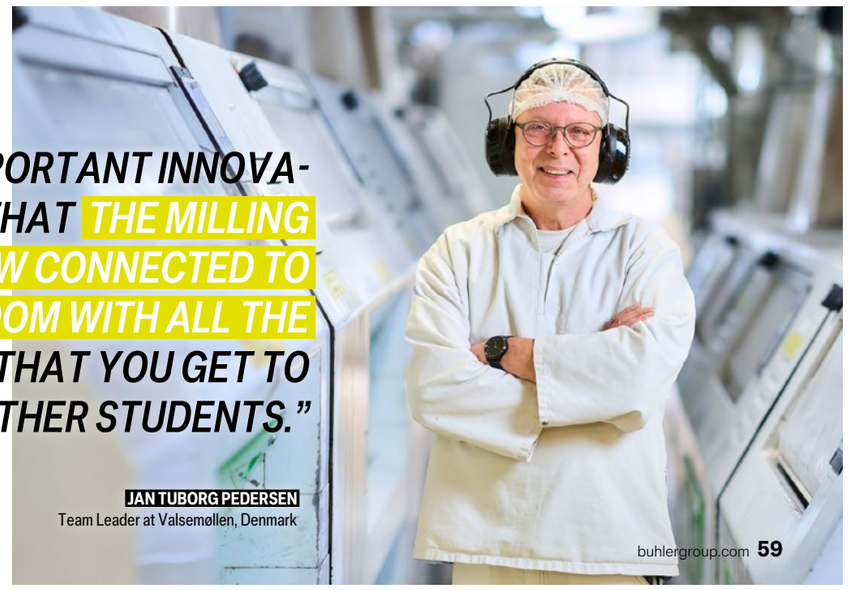
One student who is nearing the end of his 3-week course and who has already made use of the Milling Academy's new offerings, is Maximilian Schrott, Master Miller and Operations Manager at Martin Schrott & Söhne, Germany, a seventh-generation family business he plans to take over from his father. With him is Julia Wicki, a miller at Wicki Mühle AG, a Swiss family business with over 100 years of tradition, and Benedikt Hitthaler, a feed miller at A. Rieper AG in South Tyrol, Italy, which is a regional leader in feed production.

"Feed milling education with this level of quality and depth simply doesn't exist in Germany, that is why I came to Switzerland," explains Maximilian Schrott. "I've learned a lot of new things. The equipment is top-notch, and the instructors' expertise is very impressive."

According to Julia Wicki, the course is well designed. "The balance between theory and practical exercises is very well done," she says. "I also really like the bright classrooms and the many spaces where we can break off into small groups for more focused learning. We often stay after class to continue working together."

And Benedikt Hitthaler, who has already completed several training sessions with the SFT at its former location, is also impressed. "The new training center is larger and offers more opportunities," he says. "Working in small groups directly on the machines is extremely valuable. I also find the close connection to innovation particularly inspiring. We often stopped by the CUBIC during lunch breaks."

Given the shortage of skilled professionals, it is more important than ever for companies to implement a solid, holistic training strategy. On request, Bühler develops customized training programs, including on-site customer training. "We're seeing growing demand from our customers – far more requests than ever before," says Grossmann. "With the new Milling Academy, we are more than ready to meet this growing demand and continue providing the best training for millers in the future."



"THE MOST IMPORTANT INNOVATION IS THAT THE MILLING ACADEMY IS NOW CONNECTED TO A SHOWROOM WITH ALL THE MACHINES, AND THAT YOU GET TO MEET OTHER STUDENTS."

JAN TUBORG PEDERSEN
Team Leader at Valsemøllen, Denmark

A GLOBAL LEARNING ECOSYSTEM FOR FOOD AND FEED

THE MILLING INDUSTRY plays a vital role in global food security, yet it faces growing pressures: climate change, a shrinking skilled workforce, and supply chain volatility. In this challenging landscape, technology and digital solutions offer new ways to boost yield, profitability, and resilience – especially, when supported by a well-trained workforce.

Bühler continuously invests in strengthening its global education network to equip the next generation of millers with the skills they need to succeed. This commitment is brought to life through a growing offering of training programs, facilities, and partnerships dedicated to knowledge sharing and hands-on learning.

The Milling Academy in Uzwil, Switzerland, alongside the School of Feed Technology (SFT), offers over 100 courses a year to over 750 trainees in seven languages. Bühler also runs specialized programs in partnership with Kansas State University in the US, and at the training mill in Wuxi and the feed mill in Changzhou, China. Bühler's African Milling School, located in Nairobi, Kenya has served millers from across Africa and the Middle East since 2015.

The Grain Innovation Center in Uzwil provides a collaborative environment for developing and testing grain processing methods. It is closely connected to the Bühler network of research and training centers including, the Grain Processing Innovation Center in Kano, Nigeria, which is dedicated to exploring the industrial potential of local and ancient grains, as well as offering training programs.

Bühler's education and innovation efforts are supported by other research and training centers that serve multiple industrial applications for food and feed, as well as specialist facilities such as the Cocoa Competence Center in Côte d'Ivoire and the International Rice Milling Academy in India.

This global network is further strengthened through partnerships with leading academic institutes and research organizations, for example the ETH Zürich in Switzerland, DIL in Germany, and Kansas State University and the North Carolina Food Innovation Lab (NCFIL) in the US, to name a few.

By connecting scientific research with industrial practice, these partnerships support market-driven innovation in areas such as sustainable proteins, digitalization, and next-generation food production. In Singapore, Bühler and Givaudan co-run the Protein Innovation Centre, where new plant-based products are developed and scaled.

Through its extensive learning ecosystem, Bühler is shaping the future of food – building skills, advancing innovation, and helping its customers to stay competitive while driving a more sustainable and resilient food system.

1. **Uzwil, Switzerland**
   Chocolate Mass Application Center
   Coffee, Cocoa & Nuts Application Center
   Energy Recovery Center
   Extrusion Application Center
   Feed Application Center & SFT*
   Flavor Creation Center
   Food Creation Center
   Grain Innovation Center
   Insect Technology Center
   Milling Academy
   Optical Sorting Application Center
   Pasta Application Center
   Protein Application Center
   Puffing Application Center
   Swiss School of Milling St. Gallen
2. **Almere, Netherlands**
   Mixing Innovation Center
3. **Skovlunde, Denmark**
   Biscuit Innovation Center
4. **London, UK**
   Optical Sorting Application Center
5. **Reichshof, Germany**
   Confectionery Application Center
6. **Quakenbrück, Germany**
   DIL* Proteins of the Future Technology Center
7. **Beilngries, Germany**
   Grain Handling, Malting & Brewing Application Center
8. **Leobendorf, Austria**
   Wafer Innovation Center
9. **Champaign, IL, US**
   University of Illinois
10. **Bozeman, MT, US**
    Montana State University
11. **Kannapolis, NC, US**
    NC State Food Innovation Lab
12. **Manhattan, KS, US**
    Kansas State University
13. **Minneapolis, MN, US**
    Food Application Center Extrusion
    Food Application Center Specialty Milling
    University of Minnesota
14. **Raleigh, NC, US**
    Drying & Thermal Processing Application Center
15. **San Francisco, CA, US**
    MISTA Innovation Center
16. **Stockton, CA, US**
    Optical Sorting Application Center
17. **Santiago de Chile, Chile**
    USACH* University
18. **Mexico City, Mexico**
    Instituto de Investigaciones en Materiales
19. **Monterrey, Mexico**
    Tecnológico de Monterrey (TEC)
20. **Campinas, Brazil**
    ITAL* Tropical Food Innovation Center
21. **Curitiba, Brazil**
    Consumer Foods Application Center
22. **Blumenau, Brazil**
    Optical Sorting Application Center
23. **Abidjan, Ivory Coast**
    CFIA* Training Center
24. **Kano, Nigeria**
    Grain Processing Innovation Center (GPIC)
25. **Nairobi, Kenya**
    African Milling School
26. **Saitama, Japan**
    RADEC* Application Center
27. **Wuxi, China**
    Consumer Foods Application Center
    Bagging Application Center
    Extrusion Application Center
    Jiangnan University
    Milling Academy
    Optical Sorting Application Center
    Pasta & Noodle Application Center
28. **Changzhou, China**
    Animal Nutrition Training Center at AFT*
    Feed, Aqua & Pet Food Application Center
    Grain Handling Application Center
29. **Bangalore, India**
    Consumer Foods Application Center
    Flour & Rice Milling Application Center
    International Rice Milling Academy
    Optical Sorting Application Center
30. **New Delhi, India**
    Bveg Foods
31. **Jakarta, Indonesia**
    Consumer Foods Application Center
32. **Singapore**
    Protein Innovation Centre

AFT* = Asian Institute of Feed Technology
CFIA* = Centre de Formation et d'Innovation pour l'Agroalimentaire
DIL* = Deutsches Institut für Lebensmitteltechnik
ITAL* = Institute of Food Technology
RADEC* = Regional Application Development & Education Center
SFT* = Swiss Institute of Feed Technology
USACH* = Universidad de Santiago de Chile

ESPIGA I+D

WHERE TRADITION MEETS INNOVATION

Caja Rural de Navarra has played a leading role in traditional wheat flour production and oat processing for decades, but now the Spanish group senses that changing consumer needs and environmental pressures require a new perspective. Working closely with Bühler, it has created ESPIGA I+D, a cutting-edge innovation center devoted to cereal processing and its applications, incorporating among other facilities: a small industrial mill, a laboratory, and semi-industrial bakery pilot lines.

TEXT: JAMES BADCOCK
PHOTOS: JEKATERINA GLUZMAN

STANDING AT THE EDGE of rolling wheat fields on the outskirts of the city of Pamplona in northern Spain, the ESPIGA I+D – Cereal Innovation Center stands out from the countryside around it. It is here, in this pristine white box of a building, that milling group Caja Rural de Navarra is making technical advances in flour production and the manufacture of bread as well as a whole range of other products like pastries, pizzas, vegetable drinks, and breakfast cereals.

Caja Rural de Navarra has its roots firmly planted in the northern Spanish region of Navarra, from which it takes its name. The company started milling operations in 1989, and since 2022 has been part of MHM Grupo Harinero, Spain's second-largest flour producer. With this solid background in the industry, Caja Rural de Navarra decided that its next project would not just be another mill, but something more forward-looking.

The result is the ESPIGA I+D – Cereal Innovation Center, which will operate as a test site for processing different grain varieties. The ultimate goal is to develop more sustainable processes and healthier and more sustainable products for the consumer.

Integrated facility for innovation

"Our aim is for the ESPIGA I+D - Cereal Innovation Center to be a reference in Europe. There is no other integrated facility like this," says Íñigo Royo, a longtime employee of Caja Rural de Navarra and now Technical Director of MHM Grupo Harinero.

Iñaki Hualde, Technical Director of the ESPIGA I+D - Cereal Innovation Center, beams contentedly as he shows off the new facility's mill, the laboratory area separated from the machinery by a gleaming glass wall, and the ample bakery zone and kitchen space for trial dough preparation and breadmaking.

Near rolling wheat fields in northern Spain, milling group Caja Rural de Navarra has built ESPIGA I+D, a cutting-edge cereal innovation center devoted to cereal processing and its applications.

"The conception of the center stems from the Group's need to diversify products, find ways to improve efficiency, and to take part in research and development projects on a higher level involving European partners," says Hualde.

The initiative is Caja Rural de Navarra's response to consumers' demands for healthier products and society's awareness of the need to develop more sustainable production processes. In terms of flour and bread products, these challenges can be met through a number of dovetailing approaches: by promoting different cereal varieties and thereby boosting biodiversity and improving food security, and by identifying crops with a lower environmental impact which also offer enhanced nutritional properties.

One of the consumer trends that the Group has identified is the growing demand for cereals and breads with higher protein and fiber content. Another is addressing the rise in Type 2 diabetes, which can be caused by a diet that is too heavy in carbohydrates. It is one of the world's major health problems, affecting 589 million people globally, according to the International Diabetes Federation. In Spain, one in seven adults has the disease.

Given how prevalent bread is in the diets of many people worldwide, this has prompted research into making bakery products with a lower glycemic index. Sourcing alternative grains to wheat, which is the staple food Caja Rural de Navarra works with, can help to boost biodiversity in Spain's cereal belt. Hualde hopes it will also result in pleasurable surprises and the rediscovery of forgotten tastes as different grains are turned into bakery products once again. The idea is to contribute to the selection and development of more efficient crops, helping to lower the environmental footprint of bread and flours by testing varieties of grains that need less water and fertilizer during cultivation.

The surrounding Navarra region has a long history in cereal growing. Hualde and his team will make use of Caja Rural de Navarra's deep local roots to consult with farmers' associations and agricultural cooperatives to source old varieties of wheat and oats in the search for products that can be brought back from the past. Spelt, also known as dinkel wheat, is one such relict crop, formerly more popular, that was historically grown in northern Spain and offers attractive dietary properties with high protein, fiber, and vitamin and mineral content.

"There is a demand for diversification of products that are healthier and more sustainable, and there is a business opportunity in responding to this interest. We are evaluating more sustainable varieties of grain to see how they actually perform in different transformation processes," Hualde says.

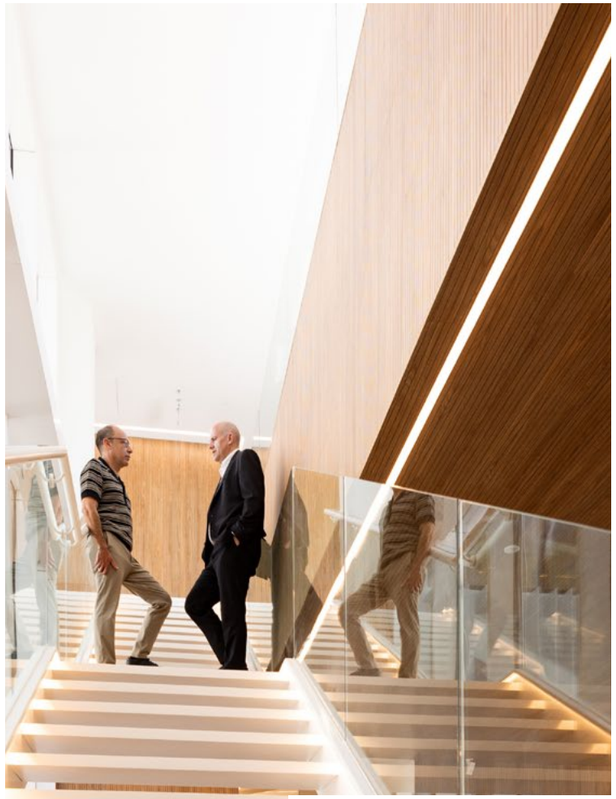
Sustainability, which Hualde says is "built into the DNA of the innovation center," also means moving towards a circular economy. This means that the center will explore the potential for greater use of secondary products from standard milling processes, such as oat bran.

"OUR AIM IS FOR THE ESPIGA I+D – CEREAL INNOVATION CENTER TO BE A REFERENCE IN EUROPE. THERE IS NO OTHER INTEGRATED FACILITY LIKE THIS."

ÍÑIGO ROYO
Technical Director at MHM Grupo Harinero

The mill that Bühler designed for the Cereal Innovation Center had to be as small as possible while recreating the results from an industrial-scale mill.

The ESPIGA I+D – Cereal Innovation Center team works on grain varieties that meet rising demand for diversified products that are healthier and more sustainable.



The teams from Caja Rural de Navarra and Bühler worked together closely to develop the optimal design with in-built flexibility.

The success was based on a strong partnership. The teams from Caja Rural de Navarra and Bühler were in daily contact.

"BÜHLER HAS COME UP WITH A FLEXIBLE AND VERSATILE INSTALLATION THAT ALLOWS US TO PLAN ALL KINDS OF TRIALS AND TESTS, AND THEY ARE ON HAND ALL THE TIME TO ADVISE US."

IÑAKI HUALDE
Technical Director of the ESPIGA I+D - Cereal Innovation Center

For Hualde, it is important that the ESPIGA I+D – Cereal Innovation Center fulfills a social mission as well as a business purpose. The work carried out at the center should contribute to better knowledge in society of the nutritional benefits of cereals as part of a balanced diet. There is also a contribution to be made in terms of training, which will benefit the cereal sector and the local economy. Hualde says that while there is a current lack of specific training opportunities in the sector, Caja Rural de Navarra plans to work with both of the universities in the region and there is an ambition to create a university degree in cereal processing.

"We plan to cooperate with universities and food tech centers across Spain. On a European level, we are initiating contacts with other research organizations relating to cereals," he says. "The center will be open to any agent from the industry – including business rivals – and our laboratory's analytical service will be officially accredited."

There are also plans for Bühler to hold training courses at the ESPIGA I+D - Cereal Innovation Center. "We share Caja Rural de Navarra's interest in creating added value for the cereal sector," says Alberto Galán, sales manager for Bühler Spain.

For Royo, the selection of Bühler to fit the milling equipment for the innovation center was "obvious," given the successful relationship between the two companies that goes back many years.

For Bühler Spain, the ESPIGA I+D – Cereal Innovation Center's project specifications represented a challenge, one the Madrid office was eager to meet. "It was a beautiful challenge, a very special case," says Galán. "The mill had to be as small as possible but still recreate the results you get from an industrial operation. Our technicians sat down with the technical directors of Caja Rural de Navarra and came up with a design that was optimal, with inbuilt flexibility so that the machinery could be prepared for any use that the center might come up with as it tests different grains."

From big idea to compact mill

While most industrial mills process hundreds of tonnes of grain per day, the ESPIGA I+D – Cereal Innovation Center's requirement was for an installation with a capacity of just 24 tonnes. "We had to think hard and play with a limited space, which was an inspiring creative process," says Galán. The task was made easier by the fact that Bühler and Caja Rural de Navarra already enjoy "almost daily communication" due to their partnership at the Group's conventional factories.

The ESPIGA I+D – Cereal Innovation Center's elegantly compact mill features Bühler's TUBO tubular push conveyor, which transports the grain to the tempering zone. In the mill, Diorit roller mills with 600-millimeter roller lengths – the smallest size

The Cereal Innovation Center also includes a large bakery zone and kitchen space for trial dough preparation and breadmaking.

"IT WAS A BEAUTIFUL CHALLENGE, A VERY SPECIAL CASE. THE MILL HAD TO BE AS SMALL AS POSSIBLE BUT STILL RECREATE THE RESULTS YOU GET FROM AN INDUSTRIAL OPERATION."

ALBERTO GALÁN
Sales Manager for Bühler Spain

VIDEO

Watch this video to learn more about the ESPIGA I+D – Cereal Innovation Center.

available – have been installed. "Diorit roller mills offer two special features," says Galán. "The three pairs of rollers are split, allowing two passes in each. And the head passes have individual controls for each roller, making it possible to play with the revolutions." This allows researchers maximum versatility to try out different grinds.

Bühler also provided a purifier and bran finishers of a smaller size than usual, with the whole installation managed with its Pluto process control system (PCS) – again a simpler version than would be found in a large industrial mill but one which fits with the facility's requirements.

"Bühler is associated with big greenfield industrial projects and, yes, we do that, but we showed here we can adapt to a smaller scale and our customer's very specific needs," explains Galán. "We can adapt in this way because of our strong presence in Iberia, where we live and breathe the reality and needs of customers, working in parallel with them. This is especially the case with Caja Rural de Navarra, a customer with whom we have a long history and have worked on everything from big new projects to small refits."

Retrofit boosts efficiency

A good example of this can be found a few kilometers from the ESPIGA I+D – Cereal Innovation Center, in Noain, where one of MHM Grupo Harinero's wheat processing plants is located. It processes 900 tonnes of wheat per day on three production lines of 300 tonnes each. Like Caja Rural de Navarra, it has a relationship with Bühler that goes back three decades. A recent addition to the Noain plant is Bühler's High-Efficiency Retrofit for Mill Pneumatics, which adjusts the milling line's energy use in real time to optimize energy resources. Royo points out that this latest acquisition is "a matter of pure efficiency" and keeps his operation "ahead of the curve."

"It's the kind of investment that anyone in the sector will have to make at some point, no matter what, so the way we see it, the thing to do is move early and do it well," Royo explains, adding that energy-efficiency investments are often eligible for public subsidies.

Royo says that Caja Rural de Navarra and MHM Grupo Harinero have set high sustainability standards, with renewable energy already making up nearly 70 percent of energy use. In 2022, Caja Rural de Navarra pioneered a sustainable wheat quality mark with Spain's AENOR, the national body for standardization and certification.

Fresh from scraping some dough from mixers for a breadmaking experiment in the ESPIGA I+D – Cereal Innovation Center's bakery, Hualde says he is convinced that Bühler was the right choice of partner for this research and development venture.

"We have an excellent relationship with Bühler in mills across the Group," he says. "They have come up with a flexible and versatile installation that allows us to plan all kinds of trials and tests, and they are on hand all the time to advise us. They also offer total technical support and follow-up work in the use of the pilot mill."

INFO

Espiga I+D

ESPIGA I+D

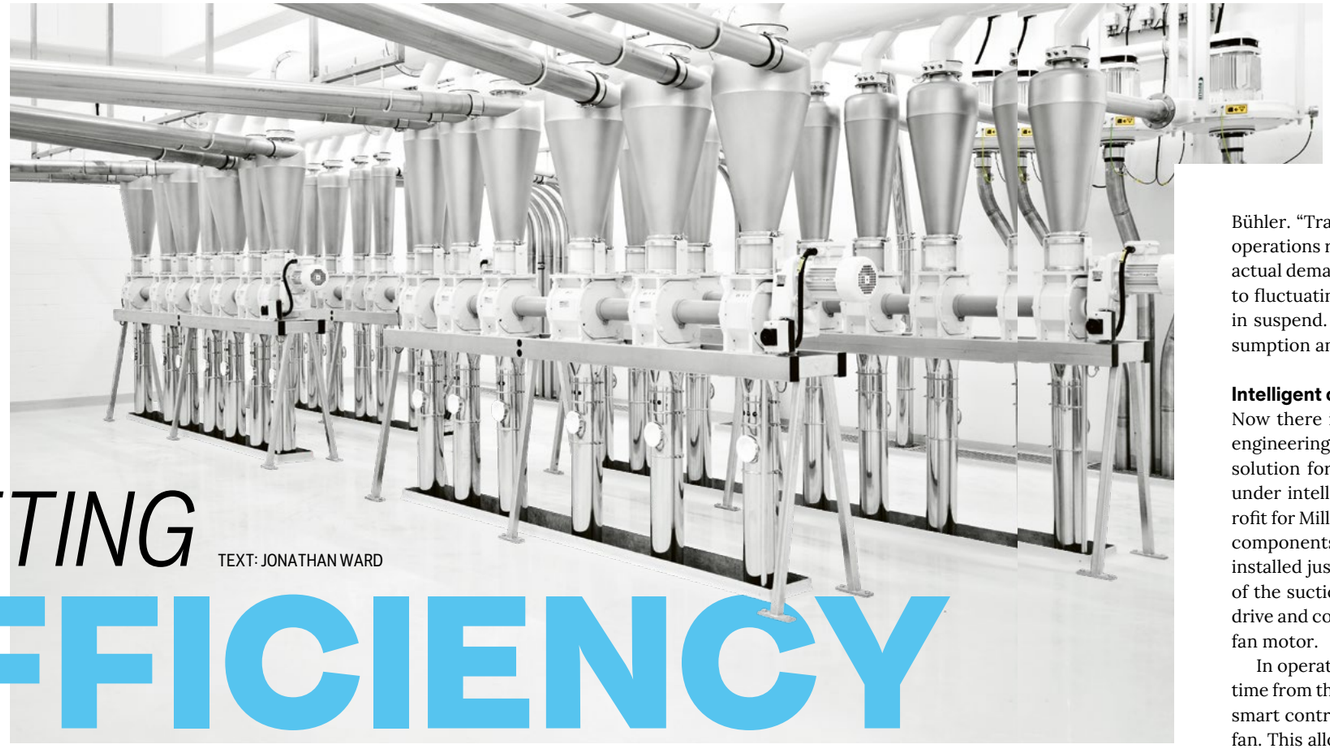
Sarriguren, Spain

Founded in 2025.

ESPIGA I+D is a cereal innovation center including a small industrial mill, laboratory, and semi-industrial bakery pilot lines.

ESPIGA I+D serves customers from Spain and other countries.

ESPIGA I+D is equipped with Bühler's TUBO tubular push conveyor, Diorit roller mill, Plansifter MPAS, Purifier MQRF, and Pluto PCS. It benefits from Bühler design engineering.



PUTTING EFFICIENCY *THROUGH THE MILL*

TEXT: JONATHAN WARD

Pneumatic conveying systems are a major driver of energy cost and carbon emissions in grain milling. Bühler has developed a retrofit system that adapts in real time according to changes in pressure demand, cutting energy consumption by up to 30 percent. The new approach is a significant step toward more efficient, intelligent, and autonomous milling operations.

IN MODERN MILLING operations, intermediate and finished products from the grinding process are transported by air. This pneumatic system is fast, flexible, hygienic, and highly automated. It allows mills to run continuously, maximizing output, and keeps dust contained for a safer and healthier working environment. These advantages are not cheap. Mill pneumatic conveying systems rely on large fans to generate the high negative pressures needed to move the material through the system. In a big mill, the high-pressure fan might be powered by a 150-kilowatt motor or larger. That makes the pneumatic system the second biggest standalone energy consumer in the grinding floor of a mill, after the roller mills that turn the grains into flour. In a typical mill section, the high-pressure fan is responsible for between 23 to 28 percent of total energy consumption.

In mill operations, as in other large-scale industrial processes, energy consumption has become a key target for efficiency improvement efforts. Historically high energy prices, especially for the electricity used to power rotating equipment, are driving up production costs and squeezing margins in a cost-sensitive commodity sector. Mill operators also face growing demands from governments and other stakeholders to monitor and reduce their energy consumption and associated carbon emissions.

Whether they want to reduce cost, carbon, or both, mill operators are increasingly searching for ways to cut energy consumption across their operations. The mill's pneumatic system is a great place to start, says Javier Lozano Díaz, Product Manager, Automation & Digital Services, Milling Solutions at Bühler. "Traditionally, high-pressure fans in milling operations run at a constant speed, regardless of the actual demand," he says. "The system does not adapt to fluctuating loads, nor does it reduce speed while in suspend. This leads to unnecessary energy consumption and inefficiencies."

BENEFITS

With a High-Efficiency Retrofit for Mill Pneumatics you can:

+ continuously adapt the speed of the high-pressure fan to maintain the equired target pressure in pneumatic conveyor ducts;
+ reduce fan energy consumption by up to 30%, and up to 80% when the mill is idling for product changeovers or maintenance;
+ install it as a standalone package or integrated it into the wider mill control system.

Find out more about High-Efficiency Retrofit for Mill Pneumatics:

Intelligent control

Now there is a better option. Díaz and the Milling engineering team at Bühler have developed a retrofit solution for mills that puts the pneumatic system under intelligent control. The High-Efficiency Retrofit for Mill Pneumatics requires only two additional components: a pressure sensor, which is normally installed just upstream of the dust filters at the end of the suction line, and an advanced variable speed drive and controller connected to the high-pressure fan motor.

In operation, the new system collects data in real time from the pressure sensor and uses a proprietary smart control to continually adjust the speed of the fan. This allows the pneumatic conveying system to operate at optimal efficiency as loads and production rates change.

The impact on energy consumption is immediate and significant. In tests at customer sites, installing the energy efficiency retrofit package can reduce the energy consumption of the high-pressure fan by 30 percent; on average by 20 percent. "Savings like that make a strong business case for this technology," says Díaz. "The new system pays for itself in less than two years in most of the sites we have evaluated. Sometimes, payback can be less than a year."

Running the pneumatic system at peak efficiency doesn't just save energy. Slower rotating speeds reduce wear and tear on fans and motors, and lower air flow rates can help dust filters last longer.

The energy efficient retrofit package can be installed as a standalone system, connected to a plant-wide Energy Management System (EMS), or integrated with one of Bühler's mill automation systems, such as WinCos or Mercury MES. Doing that creates extra improvement opportunities for operators, explains Díaz, allowing them to understand and optimize the impact of operational changes on energy consumption across their processes.

A holistic approach is key for any business seeking to reduce costs and energy consumption in industrial equipment, says Díaz. While the energy efficiency retrofit package provides a fast route to significant savings, there are plenty of other things mill operators can do to optimize their operations. "Implementing preventive maintenance helps to ensure equipment operates at peak efficiency," he explains. "Operators can also look at upgrading power-hungry equipment with energy-efficient motors and drives or using digital monitoring solutions such as Bühler's EMS to track and optimize energy consumption in real time."

To help mill operators meet their energy efficiency ambitions, Bühler offers an energy audit service in which process experts review end-to-end mill operations to identify improvement options and calculate their relative costs and benefits.

Meanwhile, Bühler is constantly looking for new ways to help customers reduce energy consumption. "The pneumatic system usually contains the largest fan in a mill, but these facilities will have dozens of other fans scattered across their operations," explains Díaz. "We are exploring opportunities to apply a similar smart control approach to these smaller units where it makes operational and financial sense to do so."

Then there is the most energy-hungry process in milling, the roller mills at the core of the mill. "The Bühler SmartMill program is a journey to optimize yield, increase product quality, improve traceability, reduce energy consumption, and increase overall plant efficiency," says Díaz. "Incorporating advanced sensors into mill equipment, including the rollers mills, helps us to understand the impact of material and process variability on energy consumption."

The ultimate vision for the program is the creation of mills that adapt continuously and autonomously to maintain peak performance.

In the port of Rauma in Finland, Oat Mill Finland (OMF) turned an 86-meter grain storage silo into Finland's most modern oat mill together with Bühler. The mill has a processing capacity of 140 tonnes per day and enables OMF to serve the growing international oat market with high-quality Finnish oat flakes.

Oat Mill Finland

A TOWERING TRANSFOR MATION

When Oat Mill Finland decided to start catering to the rapidly growing global oat market with their high-end products, they set their sights on an existing grain silo in the port town of Rauma. Standing at an impressive 86-meters-tall, the towering structure became the focal point for a dedicated team of experts determined to do the unthinkable: transform this concrete block into the most modern oat mill in Finland. A bold endeavor that came with its share of challenges.

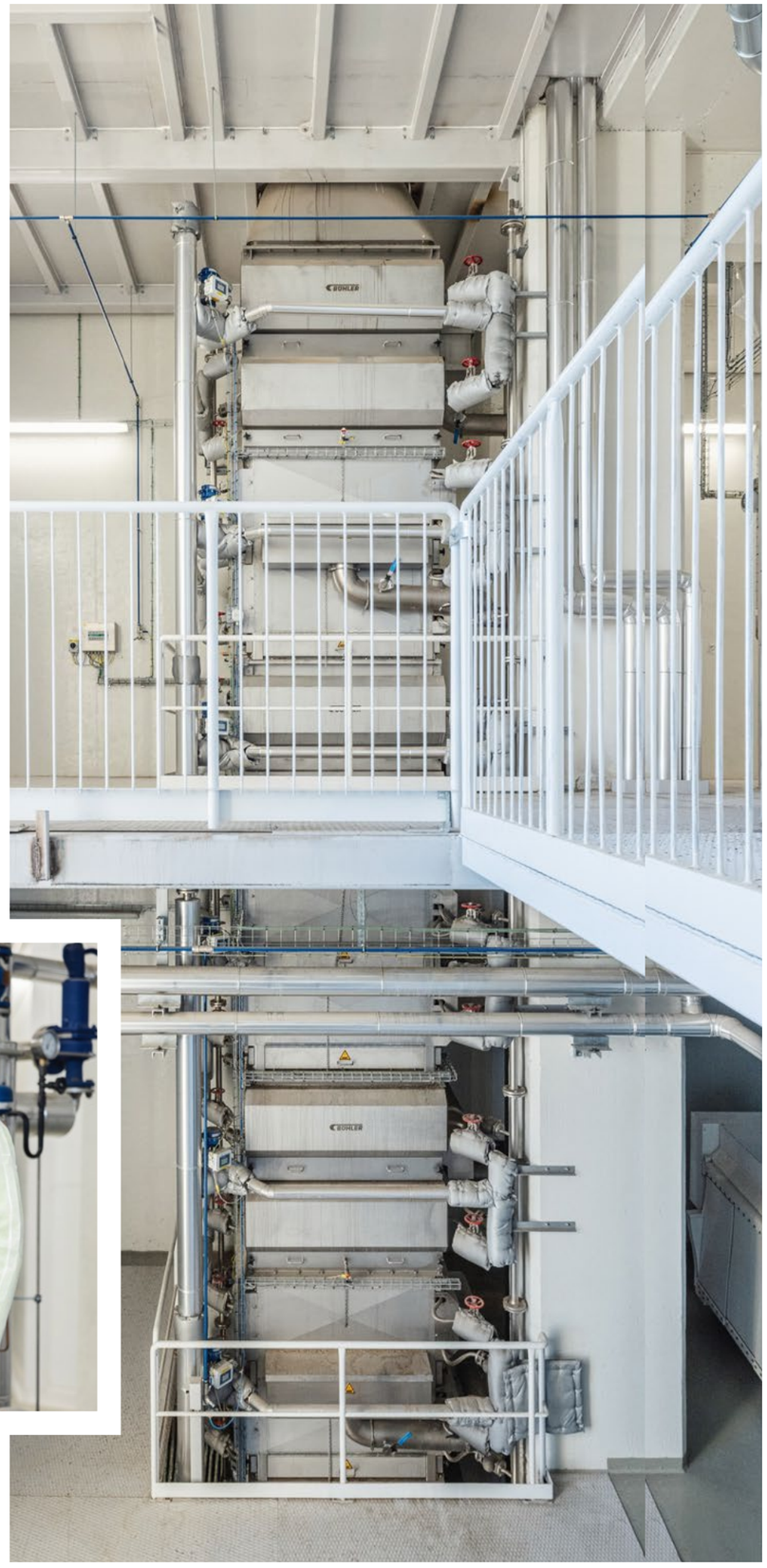
TEXT: LUKAS HOFSTETTER
PHOTOS: FABIO REICHMUTH

JARKKO TUOMOLA, CEO of Oat Mill Finland (OMF) stands on top of the impressively tall silo in the port of Rauma. The last rays of the quickly disappearing mid-afternoon sun make his smile even more contagious. It's December 2024 on the southwestern coast of Finland, and winter is tightening its grip on the country with a bone-chilling breeze from the Baltic Sea. The weather, however, has never deterred the Finns from constructing infrastructure and developing a trade system that has given the country the 13th highest income per capita in the world.

Tuomola took the 3-hour trip from the company's headquarters in Helsinki to check in with his colleagues running its flagship mill in Rauma. "What our team constructed here is much more than just an oat mill – it's the most modern oat processing plant in Finland. The fact that they built it into an existing silo and overcame so many challenges makes it even more special," he says.

Tuomola is joined by Risto Salmi, who has recently retired from OMF. He is visiting the team and providing his expertise on running the mill one last the time. "I joined OMF in October 2024 after Risto had retired and did not have the chance to thank him personally for his dedication and hard work, especially on this project. I'm glad I have now had the chance to express my gratitude and learn from Risto's experience in the industry," says Tuomola.

At 31-meters-tall, the kiln is one of the largest in the world, with a kilning capacity of 192 tonnes per day.



Back in 2020, when OMF, a subsidiary of Suomen Viljava, Finland's largest oats processor, decided to add oat flakes for the international market to their portfolio, Risto Salmi immediately joined the effort. "Our idea was to turn the grain silo into an oat processing facility to be able to ship high quality oat flakes from Finland to the world," he says.

A daring endeavor

The challenge was obvious. Converting an unusually tall, floorless structure into a functioning mill required out-of-the-box thinking. Salmi and his team of five consulted three companies for advice and support. It didn't take long for them to choose Bühler. "We knew from previous projects that Bühler always delivers. This time, we appreciated the fact that their experts shared our curiosity and willingness to turn this challenge into reality in the tight time frame we were given," he explains.

The planning and execution phase started at the height of the Covid-19 pandemic in 2020. Regardless of the circumstances, the target schedule for having the mill production-ready was set for no later than summer 2023. This tight timeline meant that all preparations, installations, and testing were completed on schedule to ensure the start of operations by the deadline.

For Severin Heeb, Process Engineer at Bühler, the oat mill at OMF was the most significant project he had led in his career since joining Bühler at age 16 as an apprentice. "The circumstances left us with very little room to maneuver and we couldn't just rely on basic engineering. We had to investigate every detail to make the most of the design. First, we arrived on site and proposed a 3D scan of the building, which gave us the possibility to play around with the layout and come up with the best possible engineering with the most benefits for OMF," says Heeb.

Severin Heeb (left) and Risto Salmi combined the latest technical know-how and decades of oat processing experience to help build the oat mill.

Working closely with the OMF team, Heeb and his colleagues decided to use the silo's height to their advantage rather than force a standard greenfield mill design into an existing structure. "One major decision was to transport the product using bucket elevators instead of pneumatic conveying systems until after the kiln. This single transport element, spanning an unusually long distance, enabled us to create a more efficient setup than using three smaller transport lines. Mechanical conveying uses up to 80 percent less energy than pneumatic conveying, which is normally used in a standard-size mill," explains Heeb.

The kiln is the heart of any oat mill. Kilning inactivates enzymes in the kernels, providing a unique taste and flavor and extending shelf life. This is achieved by adding precisely the amount of steam needed to increase the moisture content to about 17 percent and the temperature to over 98°C. This is a "make or break" process step ensuring the quality of the final product. Since the high quality of Finnish oats is a competitive advantage given the tight margins of the global oat market, the OMF team was determined to secure the best and most reliable processing solution.

A kiln the length of a blue whale

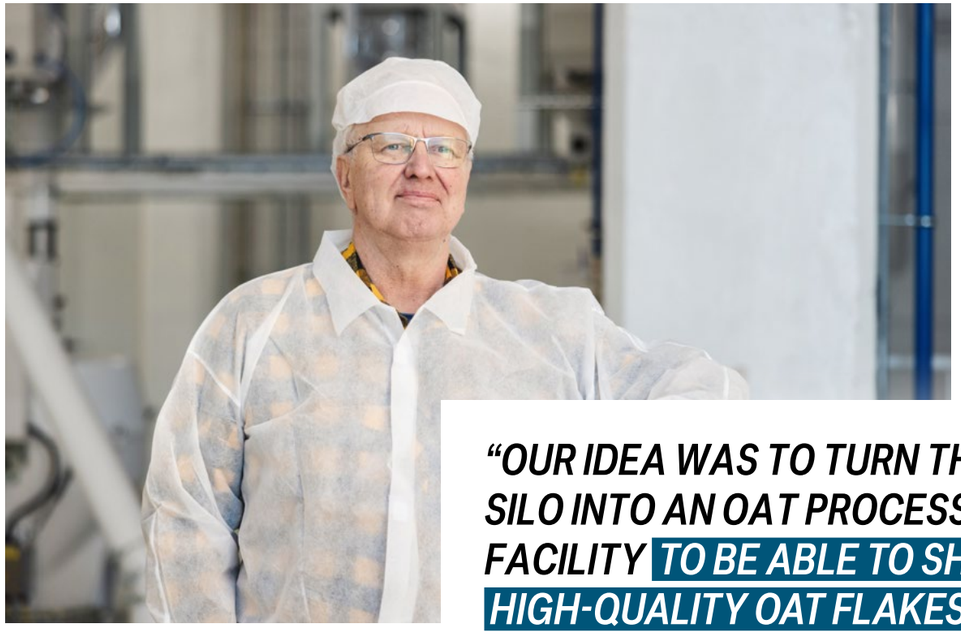
Janne Mutka, Head Miller at OMF, was part of the team from day one. He oversees the quality and quantity of oats leaving the port of Rauma. "We talked to two of Bühler's competitors to evaluate all the available options. After careful consideration, we concluded that only Bühler could deliver a kiln meeting our size and quality requirements," he explains.

Standing at 31 meters – the length of a fully grown blue whale – the raw oat kiln is one of the tallest in the world. It boasts an impressive kilning capacity of 8 tonnes per hour, or 192 tonnes per day, and is designed for continuous production.

Jarkko Tuomola, CEO of Oat Mill Finland, is looking forward to increasing OMF's global market share.

"WITH OUR INCREDIBLE TEAM, THE MOST MODERN OAT MILL IN FINLAND, AND THE FANTASTIC SUPPORT WE GET FROM BÜHLER, I'M VERY CONFIDENT THAT WE WILL CONTINUE OUR PATH OF GROWTH AND EXPANSION."

JARKKO TUOMOLA
CEO of Oat Mill Finland



"OUR IDEA WAS TO TURN THE GRAIN SILO INTO AN OAT PROCESSING FACILITY TO BE ABLE TO SHIP HIGH-QUALITY OAT FLAKES FROM FINLAND TO THE WORLD."

RISTO SALMI
Retired technology expert at Oat Mill Finland

Janne Mutka enjoyed the steep learning curve the team experienced together. "Building this new mill was like going back to the milling school – you learn something new every day. We have very good raw material in Finland, and we like to keep it like that. This is why we kiln the raw oats. If you compare it to dehulled oats, there's a big difference. The kilning of raw oats leads us to better yield, gives us brighter oats, and influences the flavor," he says.

Beyond the aesthetics and taste, oats are rich in dietary fiber, antioxidants, and high in protein. No additives are used in processing oats. The towering kiln, which resembles a gigantic organ in a cathedral, both in appearance and in the way it sets the tone and pace for production. Meanwhile, state-of-the-art processing equipment keeps operations running smoothly 24/7.

"Two SORTEX optical sorters on the dehulling floor guarantee highest efficiency and yield. We used the building height to our advantage and designed the process so that the entire dehulling and sorting process requires only one product re-lift instead of the usual two to three needed for hull separation and optical sorting of oats and groats," explains Heeb.

The same principle applied to the cutting and flaking process. By placing the cutting line, including intermediate silos, above the flaking line – rather than beside it, as is usually done – the steel-cut oat groats do not require mechanical or pneumatic conveying to the flaking line. After months of navigating supply chain disruptions and other challenges caused by the Covid-19 pandemic, the project had finally reached the installation phase. One challenge was that the price for steel beams had more than tripled from EUR 0.90 per kilogram to EUR 2.80 per kilogram, forcing the team to plan orders individually, rather than place one complete order.

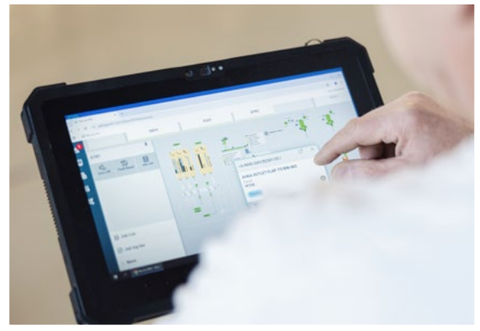
Heeb spent 3 months in the summer of 2023 working alongside the OMF team to prepare the mill for full-scale production. "Seeing the oat fields and experiencing the Finns' deep connection to nature – especially during Midsummer, when the long daylight hours bring a unique energy to the countryside – helped me understand why this project was so important to them," Heeb says. By July 2023, the mill was fully operational, with a daily processing capacity of 140 tonnes of kilned and dehulled whole groats or flakes.

Boosting efficiency and uptime

Located just steps from the cargo docks, the mill is designed for continuous operation, as any disruption would have severe implications on the supply chains. This is why the team opted for Bühler's latest automation system. "The mill has a night mode, allowing it to operate cleaning, kilning, and dehulling processes without a night-shift operator. If an issue arises, an on-call employee receives a text or email

The huller MHSA from Bühler precisely hulls the oats and ensures a high throughput with minimum breakage.

Digital touchpoints across the mill enable OMF to take data-driven actions to improve the mill's performance.



"WE HAVE VERY GOOD RAW MATERIAL IN FINLAND, AND WE LIKE TO KEEP IT LIKE THAT. THE KILNING OF RAW OATS LEADS US TO BETTER YIELD, GIVES US BRIGHTER OATS, AND INFLUENCES THE FLAVOR."

JANNE MUTKA
Head Miller at Oat Mill Finland

“OMF TRANSPORTS THE PRODUCT USING BUCKET ELEVATORS INSTEAD OF PNEUMATIC CONVEYING SYSTEMS UNTIL AFTER THE KILN. MECHANICAL CONVEYING USES UP TO 80 PERCENT LESS ENERGY.”

SEVERIN HEEB
Process Engineer at Bühler

VIDEO

Watch this video to learn how OMF and Bühler built the most modern oat mill in Finland.

INFO

Oat Mill Finland

Oat Mill Finland

Rauma, Finland

The parent company Suomen Viljava was founded in 1918. OMF was established in 2021, and the mill started production in 2023.

Oat Mill Finland produces a variety of oat groats, oat flakes, and steel-cut oats as well as oat husk pellets as a side product from its Rauma mill.

The company supplies customers globally with various oat products.

Suomen Viljava operates 19 silo facilities which include Bühler’s technology for loading and unloading, transporting, cleaning, and sorting as well as one oat mill which is fully equipped with Bühler oat processing technology.

notification. I don’t have to worry about anything, and I can trust it 100 percent. When I’m working in the mill during the day, other tools such as YMS (Yield Management Service) greatly enhance our ability to increase yield. One of my favorite tools is Bühler Insights Replay, which allows us to look back at our processing data to make the right adjustments for running the mill even more efficiently,” explains Mutka as he checks production specifics on his tablet.

With the mill running like clockwork and the next cargo ship ready to be loaded with Finland’s premium quality oat destined for the international market, Tuomola bids farewell to the OMF and Bühler team that made this incredible transformation possible. “What they accomplished here is the result of dedicated people willing to go the extra mile. They stood together through technical challenges and the uncertainties of the height of the pandemic,” he says. “Today, we are growing rapidly and our customers are very happy with the consistent high-quality oats we deliver. With our incredible team, the most modern oat mill in Finland, and the fantastic support we get from Bühler whenever we need it, I’m very confident that together we will continue our path of growth and expansion.”

Siemer Milling Company

A LEGACY BUILT ON PARTNER-SHIPS

TEXT: NICK MANLEY
PHOTOS: SYDNEY PRITKIN

True partnerships require more than shared goals, they demand mutual respect, long-term trust, and a willingness to grow together. In an era when "partnership" is often reduced to a marketing term, Siemer Milling Company stands out. For more than 140 years, the company has cultivated meaningful, multi-generational relationships with suppliers, customers, employees, and technology providers that have fueled its evolution from a local mill to a leading force in soft wheat flour production.

FOUNDED IN 1882 as Hope Mills in Teutopolis, Illinois, the company began as a partnership between the Uptmor and Siemer families. Twenty-four years later, Joseph Siemer and his son, Clemens, bought out the interests of the Uptmor family and named the company Siemer Milling, setting a path to becoming a leader in soft wheat flour milling in the United States.

Now, with a network of three sites, Siemer Milling processes more than 2,300 tonnes of soft wheat a day. Their mills operate 24 hours a day, 6 days a week. The high-quality flour they produce is shipped to a wide range of regional bakeries, mixing facilities, and food service organizations.

This 143-year journey has not been without its challenges. "Times were rough for flour millers in the 1930s and 40s," explains Rick Siemer, President of Siemer Milling. "People moved away from home baking and started buying their breads and crackers ready-made. As a result, our own commitment to milling declined." It was not until a chance visit in 1960 that the passion was reignited within the Siemer family.

Partnerships making a difference

When the Bühler milling team first visited Siemer in 1960, they brought with them designs for new types of milling technologies. The two companies discussed replacing their existing equipment with Bühler's new solutions. "That was really a turning point, maybe the decisive turning point in our business after having been around as millers for some 70 years," Rick Siemer says. "My father realized this was an opportunity to get back into milling in a significant way."

The commitment was made at that time to invest in a new mill in Teutopolis, with the highlight being Bühler's new pneumatic roller mill, a picture of which graces the company's timeline in the West Harrison office. In the nearly 70 years since, Siemer has added mills in Hopkinsville, Kentucky and West Harrison, Indiana – all equipped with the latest Bühler milling solutions available. "I say we are in business because we had the chance from a fairly early stage to work with Bühler," Rick Siemer says.

This partnership has given Siemer the ability to serve their customers in a way that keeps them coming back. "We have fantastic customer relationships," says Rick Siemer. "We love to say we have partnerships with our customers because those relationships are very, very important to us."

"I SAY WE ARE IN BUSINESS BECAUSE WE HAD THE CHANCE FROM A FAIRLY EARLY STAGE TO WORK WITH BÜHLER."

RICK SIEMER
President of Siemer Milling

And the partnerships extend far beyond their equipment supplier and customers. “We have true partnerships with our bankers, our transportation providers, other contractors, our growers, and grain merchandisers,” Rick Siemer says. “We’ve worked with many of them for a very long time. They understand our needs and our business, and we understand theirs. These partnerships have been key to our success.”

Rick Siemer has extended the partnership to the company employees as well. The company is now 30.5 percent employee-owned. Up until 2000, the company had several shareholders who split ownership with the Siemer family. According to Rick Siemer, they were not active in the business and were understandably interested in monetizing their investment. In the past he had been excited about the possibility of an ESOP, or Employee Stock Ownership Plan, so after buying out his shareholders, he decided to institute one at Siemer Milling Company.

It is a partnership that makes a lot of sense for both the company and the employees. On the company side, Siemer Millinggets employees who care about the success of the company. “It’s not just a simple economic proposition,” explains Rick Siemer. “Because of this plan, they want to do a better job. The people around them want to do a better job. They encourage that sort of thinking.” And it’s not just the employees in the mill. The offer is also extended to people in the offices, including the employees in accounting and sales.

On the employees’ side, when the ESOP participant retires, they are invited to sell their shares back to Siemer. “And not one has passed up that opportunity,” says Rick Siemer. The shares are converted to cash, which makes the employees’ retirement a good deal more comfortable. “I’m very proud to be able to provide this kind of financial security to those people who have made the business successful, who have made it work,” he says.

“WHEN WE HAVE AN IDEA, WE PUT IT IN FRONT OF BÜHLER, AND THEY ALWAYS COME BACK WITH A SOLUTION. WE WORK TOGETHER VERY WELL.”

SUNIL MAHESHWARI
Vice President at Siemer Milling

The latest partnership bears fruit

Earlier this year Siemer commissioned a new B mill on the West Harrison site. Once again, Bühler brought in the latest milling technologies to serve Siemer’s needs, including new controls, weighing and dosing systems, the new SORTEX H optical sorter, and much more. The site’s A mill was built in 2015 and produces 600 tonnes of flour per day.

The new B mill adds another 150 tonnes of daily production. “The new mill was a demand from our customers,” says Sunil Maheshwari, Vice President at Siemer Milling. “Our sales group was looking for extra capacity. And we could see the future that is growing in Indiana and Ohio.”

When the A mill was originally built, there was some under-utilized space left. When the idea arose to expand the site to meet customer demand, the challenge was how to do so and not incur a lot of construction costs. The decision was made to utilize the extra room to its fullest. This, of course, came with its own set of challenges. “Whenever you are modifying a building and you want to put a flour mill into an existing building, you have to consider a lot of different aspects,” explains Maheshwari. “Building loads, building area, cutouts, and so forth.”

Siemer brought their ideas and their concerns to the Bühler team, who came back with blueprints and a plan for success. Working with Siemer’s civil contractor, Bühler and Siemer constructed the company’s most modern mill. The whole process, from start to finish, took about 18 months.

Siemer relies on Bühler’s SORTEX H to deliver clean, safe, high-quality wheat to its mills.

At the West Harrison site, miller Blake Coy is able to control A mill and B mill using Bühler’s Mercury MES automation system.

The B mill also brought along an upgrade of the existing A mill from WinCos to the new Mercury control system. Now, the entire site is managed by the same ultramodern Mercury system. This new system, according to Maheshwari, makes running and staffing the mill easier. “The workforce in the milling industry is not as experienced as it was 20 or 30 years ago,” he says. “The younger generations like to work with computers. They want everything in their hand, on their tablets.” But he does not see this shift as a bad thing. In fact, it reminds him of when he first started at the West Harrison site in 2015, adapting to new tools and ways of working himself. “Every miller was hired from outside,” Maheshwari explains. “But they picked up the operational side of things very quickly because of the software. They are savvy about computer usage.”

This ease of operation has perhaps contributed to the success of the B mill startup. “From day one, the mill has run at full capacity,” says Maheshwari. “Every new project has a few hiccups, but it has been running at full capacity the whole time, and we’re running six and a half days a week now.” Maheshwari chalks the success of this project up to the partnership between the two companies.

“When we have an idea, we put it in front of Bühler and they always come back with a solution,” he says. “And we work together very well to implement these solutions. Bühler can count on us for honest and open feedback on solutions they want to try in our facilities such as new machine trials, and we can count on them to have what’s right for Siemer and our customers at the heart of their solutions.” He acknowledges that not everything goes right all the time. “But we work through it, and in the end the results are always positive. It’s what makes a partnership.”

Stefan Schneider, Bühler’s Key Account Manager for Siemer, can only agree. “It’s that mutual respect and drive for innovation and excellence. Siemer is a

With its recent addition of a B mill, Siemer’s West Harrison, Indiana site now produces around 750 tonnes of flour a day.

Rick Siemer (seated) will turn over the management of the Siemer Milling Company to his son, Henry Siemer, later this year.

Henry Siemer says with an almost imperceptible smile. Indeed, his father has cast a very long shadow with regard to the company's success. When Rick had first taken on a leadership role in the family business, Siemer Milling was still a relatively small business. Over the course of his tenure, the company has grown considerably.

But there is still a lot to be done. Not the least of which is growing and maintaining the partnerships that have been formed. With respect to their growers, whom Henry Siemer respects deeply, he sees opportunities to continue to promote programs for growing wheat in regions that are farther north. "We are partnering with scientists at the University of Illinois and the University of Kentucky."

Siemer has invested heavily in these universities with million-dollar endowments. "They are pushing our understanding of wheat genetics, wheat breeding, and how to manage wheat crops in the field in order to get the best yield," Henry Siemer says. "Each year we're getting a few more acres north as advancements in our understanding of wheat breeding and wheat growing continues. We're able to offer these participating farmers premium programs, paying them above already agreed upon prices if their wheat is presenting certain qualities that we find really desirable."

> ***"WHAT WE'RE LOOKING FOR IS TO BE INNOVATIVE – TO BE THE NUMBER ONE SUPPLIER OF WHEAT-BASED SOLUTIONS TO OUR CUSTOMERS."***
>
> **HENRY SIEMER**
> Future President of Siemer Milling

And then there is Siemer's ongoing commitment to sustainability. "For Siemer, sustainability is all about efficiency," says Henry Siemer. "We are working with a bulk commodity crop, and we have a saying that good millers don't throw anything away and they don't give anything away." Everything that comes into the Siemer mills gets used in some form. We clean off incidental material from the farm fields that we cannot use, and find someone that can get functional use out of it."

Henry Siemer sees a clear path forward for Siemer. "It's a bit like what we have seen already over the last 30 years," he says. "Continued growth, investment with our farmers so that they will continue to provide us with a great wheat crop, partnerships with our customers so that they know they can rely on us, and so that we can provide services to them more efficiently and provide better value for both of us."

So does this mean more of the same? Hardly. Progress is the name of the game. "We are going to be expanding our volume capacity," says Henry Siemer. "And we are going to be looking into high-value opportunities with wheat flour. If that requires some additional process and new technology investment, we'll give that a go. If it requires working in partnership with a third party, then that's what we'll do. What we're looking for is to be innovative – to be the number one supplier of wheat-based solutions to our customers."

very forward-thinking company and working with them has been the highlight of my career," Schneider explains. He sees parallels between the two family-owned companies that extend all the way down the respective corporate ladders. "We're both very collaborative, open, and professional. I find them very understanding, with good, open discussions, and really great problem solvers. In the end, we're able to work together to produce a product that we can all be proud of."

Passing the torch

Later this year, Rick Siemer will step down as president of Siemer, tapping his son, Henry, to take the helm. "I'd be lying if I said I wasn't a little nervous," rience and my awareness of benefit to Henry and to the company. Maybe I'll get involved in some special initiatives that don't naturally fall into other people's job descriptions."

Rick Siemer could easily be mistaken for a strict pragmatist. But on the opening screen of Siemer Milling Company's corporate video there is a quote from Socrates: "Nobody is qualified to become a statesman who is entirely ignorant of wheat." It is a poetic notion that carries a very practical message. How can you possibly lead a state if you have no knowledge of how people are fed?

Rick Siemer will be the first to tell you that he is not himself a miller. "I lead a flour milling business," he says. But even here he is able to see the romance in Siemer's place in feeding the people. "I guess I get emotional about it, to the very large extent to which, yes, through our company, our customers, and all these partnerships we are feeding people. We are a critical element in enabling people to have better lives because they have sufficient food. We are very, very proud to be a part of that aspect of human life and civilization."

No setting sun

As Henry Siemer carries the company forward, what lies in store for his father? Rick Siemer hopes his legacy is already in motion, seen most clearly in the transition of leadership to his son. Though he jokes that a family business can feel like a life sentence, he is far from ready to step away. "I'll take a different position here, perhaps executive chairman, or something similar," Rick Siemer says. "I find the business very interesting. I find it very fulfilling. I want to continue to be here. I want to be able to make my expe-

INFO

Siemer Milling Company

Teutopolis, Illinois, US

- Founded in 1882.
- Siemer Milling is a soft wheat flour producer in the US, operating out of three milling sites in Teutopolis, Illinois, Hopkinsville, Kentucky, and West Harrison, Indiana.
- The company supplies bakeries, mixing facilities, and food service providers in the central region of the US.
- Siemer Milling employs the latest Bühler milling technology across all of its mills.

Haymouda Ghadda (right) and a colleague walk through WAFA Holding's grain storage area.

WAFA Holding

TRANS-FORMING THE FOOD LANDSCAPE IN MAURITANIA

TEXT: HANANE HAMIMACH
PHOTOS: OLIVER KARSTEL

Driven by a commitment to food security and economic growth, WAFA Holding is reshaping Mauritania's food industry. In working with Bühler, the company has established a state-of-the-art food park and set new standards for local production, food safety, and food security, creating jobs for Mauritanians. It has been a transformative journey that addresses the increasing food demands of the nation.

IN 2009, Sidi Mohamed Ghadda, CEO of WAFA Holding, embarked on a project to revolutionize Mauritania's food industry. Mauritania is a desert country with a great deal of pastoral land, but very little arable land. Its frequent droughts have led to a concerning food and nutritional security situation, according to the World Food Programme, and it has relied heavily on food imports.

Up to 2009, WAFA Holding, like many other local companies, imported products from abroad and managed local distribution. However, Sidi Mohamed Ghadda decided that WAFA Holding should instead produce all essential products locally – flour, semolina, pasta, couscous, and more. Founded the same year, WAFA Holding's subsidiary Grand Moulins d'Afrique (GMA) became the cornerstone of the company's ambition to ensure food security and foster economic growth.

The impact has been not just on the company itself, but also on the wider economy. As WAFA Holding stopped importing food products and transitioned to local production, Mauritanian markets that had previously predominantly stocked imported products instead began to offer primarily locally produced goods.

GMA focuses on the production of both soft and durum wheat, ensuring high-quality production from raw materials to finished products in order to address the increasing food demands of the nation. All of its plants are equipped with Bühler solutions, ranging from storage silos to the mill, the animal feed factory, and the pasta and couscous production facility. "WAFA Holding's strategic alliance with Bühler has been pivotal in maintaining continuous productivity and quality," says Faiz Marrakchi Brahim Ghadda, General Manager of GMA.

Today, GMA boasts a daily production capacity exceeding 730 tonnes. Coupled with an impressive storage capacity of over 100,000 tonnes, this allows for steady supply and quality control of cereals including soft wheat, durum wheat, maize, and barley. Effective storage solutions are key to quality control and food security. GMA ensures cereals are stored under optimal conditions to prevent spoilage, contamination, and other risks. These reserves also act as a strategic buffer against supply chain disruptions, enabling WAFA Holding to maintain the steady availability of essential food products during periods of uncertainty or increased demand. "Our storage capacity reinforces Mauritania's food security, ensuring a continuous supply of essential cereals," says Faiz Marrakchi Brahim Ghadda.

The food park also includes an animal feed production plant, which supports local livestock farming by providing high-quality feed that improves both productivity and the long-term viability of the sector. By promoting more efficient resource use and reducing dependence on imported feed, the plant contributes to a more sustainable livestock industry in Mauritania. The strategic location near the port of Nouakchott also lowers transportation costs and enables faster supply of raw materials.

SIPAM (Société de pâtes alimentaires), another entity within WAFA Holding, complements GMA by receiving high-quality wheat for pasta production. This seamless integration aligns with WAFA Holding's aim of increasing local production. The company was established in 2021 and operates Bühler production lines for pasta, spaghetti, and couscous. Haymouda Ghadda, General Manager of SIPAM, says that the Bühler technologies used in their operations help them produce a significant impact on local

WAFA Holding is strategically located near the port of Nouakchott.

VIDEO

Watch the video to learn more about what WAFA Holding has achieved with Bühler's support.

Faiz Marrakchi Brahim Ghadda and Ayoub Ben Massoud discuss the improvements in product quality that Bühler plansifters bring to GMA.

"TODAY WE HAVE ACHIEVED NATIONAL SELF-SUFFIENCY. LOOKING AHEAD, WE AIM TO FURTHER ENHANCE LOCAL PRODUCTION AND EXTEND OUR POSITIVE IMPACT TO NEIGHBORING COUNTRIES."

SIDI MOHAMED GHADDA
CEO of WAFA Holding

production and the economy. "Equipped with Bühler's advanced technologies, our production lines ensure top-notch quality and efficiency," he explains. "This supports our mission of meeting national market needs."

Partnership and shared vision

According to Ayoub Ben Massoud, Key Account Manager at Bühler Maghreb, the long-standing relationship with WAFA Holding is built on a shared commitment to delivering healthy food products to Mauritania and the region. "Our collaboration with WAFA Holding began over 15 years ago. Since then, we've supported them in reaching significant milestones in food production," he says. "WAFA Holding has consistently invested in Bühler's latest technologies to improve product quality, increase profitability, and reduce energy consumption."

Bühler's advanced solutions, such as the SORTEX optical sorter and the WINCOS automation system, significantly enhance production quality and efficiency. With SORTEX the company can precisely detect and remove impurities from cereals, ensuring that only the highest quality grains are processed. This results in consistent product quality that exceeds national standards. The WINCOS automation system provides comprehensive monitoring and control over the entire production process. By leveraging real-time data analytics, WINCOS optimizes machine performance, reduces downtime, and ensures efficient resource utilization.

WAFA Holding also relies on continuous support from Bühler through 24/7 services ensuring reliable production and addressing any operational issues promptly. "We have always been by WAFA Holding's side, offering specialized support and ensuring uninterrupted production," says Ben Massoud.

Bühler plays a supporting role in WAFA Holding's operations, particularly through its maintenance and after-sales services, which help ensure reliable and efficient production. "Bühler's support is vital to our success. Their continuous engagement allows us to use the latest technologies and adhere to national standards," says Faiz Marrakchi Brahim Ghadda.

It has been a transformative journey for WAFA Holding, from distributing imported food products to establishing a fully integrated food park. But the impact is far wider. The social and economic benefits brought by WAFA Holding's projects have not only transformed the local food production landscape but also provided more than 180 employment opportunities to Mauritanians, contributing positively to the local economy.

WAFA Holding is committed to not only providing jobs but also investing in the training and development of the local and national workforce. Many of their employees have been with the company for several years, benefiting from comprehensive training programs that equip them with the necessary skills to operate Bühler's advanced technologies and maintain high standards in food production.

Ensuring food security

"By shifting from import dependency to local production, WAFA Holding has significantly impacted Mauritania's food security and economic stability," says Abdelkrim Alahiane, Bühler General Manager of Maghreb. "They focused not only on financial gain but also on social benefits and how they could positively impact Mauritania and neighboring countries. Now products the people need are available and locally manufactured."

WAFA Holding's commitment to making continuous improvements and driving innovation positions them as pioneers in Mauritania's industrial landscape. Today, the company is poised to continue its growth trajectory. "Fifteen years ago, we only imported livestock feed, wheat, and flour. Today we have achieved national self-sufficiency," explains Sidi Mohamed Ghadda. Looking ahead, we aim to further enhance local production and extend our positive impact to neighboring countries."

INFO

WAFA Holding

Nouakchott, Mauritania

- Founded in 1980.
- WAFA Holding produces flour, semolina, pasta, couscous, and compound feed for animals.
- WAFA Holding's customers are in Mauritania and neighboring countries.
- WAFA Holding has storage silos for grains, soft and durum wheat mills, a feed mill, and a pasta and couscous factory, all equipped with Bühler solutions.

SPOTLIGHT ON ADVANCED MATERIALS

Bühler's Advanced Materials segment includes Die Casting, Grinding & Dispersing, and Leybold Optics. Find out how our businesses support our customers across a wide range of industries with innovative solutions that increase efficiency and improve the quality and sustainability of their products.

Wuxi, China

EXPANDING R&D FOOTPRINT IN CHINA

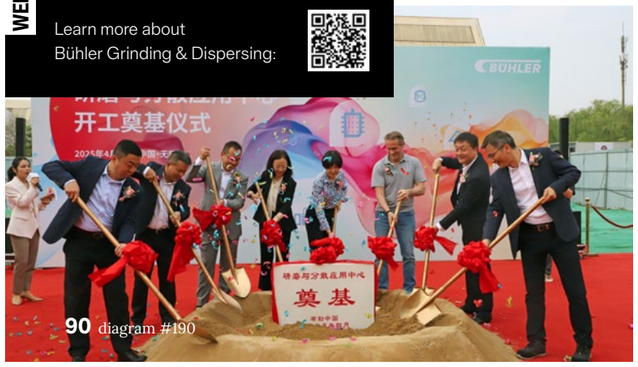
Bühler has broken ground on its new Grinding & Dispersing (GD) research and training center in Wuxi, a strategic investment to strengthen its position in China's GD market. Scheduled for completion in June 2026, the facility will focus on innovations in inks, coatings, agrochemicals, cosmetics, and next-generation battery technologies.

The new center will boost Bühler's local R&D capabilities, enabling faster development of customer solutions while supporting regulatory compliance. It will also serve as a key venue for staff training, customer collaboration, and market insights.

"Continuous innovation is our core competitive advantage," said Linda Yang, Member of Bühler's Board of Directors, at the ceremony. "We are committed to driving our GD business from 'small and beautiful' to 'big and strong' for sustainable growth."

Building on this, Bühler COO Holger Feldhege highlighted how the investment will help Bühler stay ahead in a competitive market: "China is a key market for our GD business. This continued investment ensures we can better meet our customers' needs and support steady growth in the region."

WEB Learn more about Bühler Grinding & Dispersing:



WEB Learn more about Bühler's battery production solutions:

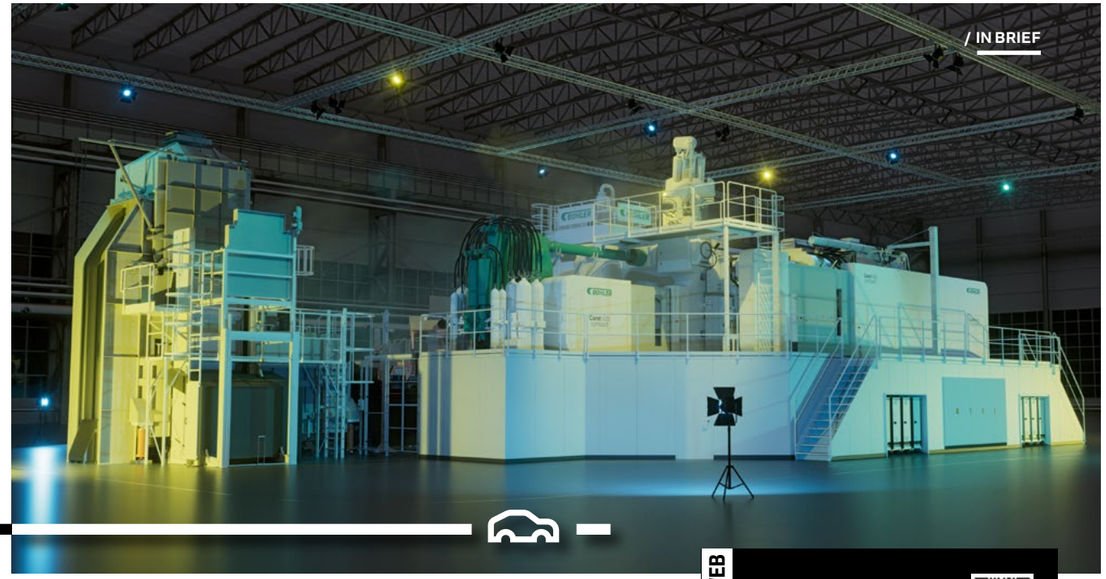
Teverola, Italy

ENERGIZING EUROPE'S BATTERY PRODUCTION

Bühler's continuous mixing technology will power Seri Industrial Group's expansion of lithium-ion battery manufacturing in Italy. FIB S.p.A., a Seri subsidiary, has selected Bühler to supply four advanced mixing lines for electrode slurry production at its new Teverola 2 plant near Naples. With an annual capacity of 8 gigawatt hours (GWh), the facility is a key milestone in Europe's battery value chain.

This builds on the successful partnership at Teverola 1, where Bühler's technology proved its efficiency and scalability. The new continuous mixing systems streamline production, cut energy use by up to four times, and reduce scrap through advanced in-line quality control.

"Bühler's solutions offer unparalleled efficiency and sustainability, making them the ideal partner for this project," says Andrea Civitillo, Managing Director at Seri Industrial and FIB. Production at the Teverola 2 site is set to begin in 2026, supporting Europe's growing demand for renewable energy storage and electric mobility.



WEB Learn more about Bühler's megacasting solutions:

Uzwil, Switzerland

BÜHLER CELEBRATES 50 MEGACASTING SOLUTION ORDERS

Bühler has achieved a major milestone with the order of its 50th Carat megacasting solution – highlighting its position as a key enabler of megacasting in the automotive industry. Since introducing its megacasting solutions in 2020, Bühler has supported leading carmakers in transforming their production processes to meet the evolving demands of next-generation vehicle manufacturing.

Megacasting enables the production of single-piece components like front or rear underbodies and battery housings, replacing complex assemblies of smaller parts. This not only simplifies manufacturing and improves structural integrity but also enables lightweight vehicle design – making it a more sustainable solution. Currently, six of the world's top 10 carmakers have embraced megacasting technologies – four of which have placed orders with Bühler.

Carmakers such as Volvo and Honda, and suppliers to original equipment manufacturers (OEMs), including Duoli Technology, Albert Handtmann Metallgusswerk, and GF Casting Solutions, have integrated Bühler Carat megacasting solutions into their operations to produce large structural parts for electric vehicles. Bühler's megacasting installations are in operation across the globe, from North America to Europe and Asia.

"The order of our 50th Carat megacasting solution is a major achievement. What began as a bold idea has become a transformative force in automotive manufacturing," says Cornel Mendler, Managing Director Die Casting at Bühler. "It reflects the strong relationships we've built with our customers, partnerships based on trust, innovation, and long-term success."

The Carat megacasting series – introduced in 2020 with the Carat 560 and 610, followed by the Carat 840 and 920 in 2021 – delivers die-locking forces from 56,000 to 92,000 kilonewtons and is purpose-built to meet the demands of large structural car components.

To support manufacturers entering this space, Bühler provides guidance across the entire lifecycle, from part design and cell engineering to process optimization and long-term service. "Many of our customers are implementing megacasting for the first time," explains Martin Lagler, Director Global Application Technology at Bühler. "That's why we focus on transferring knowledge early on and being present throughout the journey – from initial trials to stable production."

Bühler's machines are built with longevity in mind – many of its die-casting systems have remained in operation for decades. Megacasting solutions are also engineered for long-term value, with high uptime, low scrap rates, and a design philosophy that enables upgrades. This lasting equipment life cycle helps customers lower operating expenses while reducing environmental and capital costs of replacement.

With manufacturing and service hubs in Europe, China, and the US, Bühler ensures local expertise with global consistency. "Our global presence means we can act fast and speak the customer's language, technically and culturally. We will continue to invest in the technologies that help our customers succeed." says Mendler. "Every new project is a chance to push boundaries and drive the industry forward. The potential for innovation is enormous."

WHERE POWERFUL FORCES *ACT WITH PURPOSE*

Duoli Technology Group

It is not only in the manufacture of electric vehicles that China leads the world; suppliers in the Middle Kingdom are also driving the future forward. In aluminum die casting, the Duoli Technology Group is taking a prominent role – together with Bühler's megacasting solutions.

TEXT: BURKHARD BÖNDEL

THE HALL IS NOT YET FINISHED: walls and steel pillars are still being erected. The area is unmistakably a construction site; access roads are muddy, made passable with centimeter-thick steel plates. Bare container offices stand in front of the building. But don't be fooled – anyone who wants to know where the global hotspot for megacasting is currently emerging should head straight to Changzhou, not far from Shanghai. Here, the Chinese automotive supplier Duoli Technology Group is building a new factory, which, when fully expanded, will house eight megacasting cells for producing the largest possible structural components.

The company is an inspiring example of entrepreneurial spirit, strategic foresight, and innovation. Founded in 1998, Duoli has quickly developed into a key supplier of stamped and welded parts for the domestic automotive industry. Today, its 14 locations are spread across China, with an annual turnover of around CHF 500 million. Despite this rapid rise, Duoli has always kept an eye beyond its immediate horizon. "We analyzed the trends in our industry and realized that we could only continue our success if we also invested in a new, future-forward technology," explains Jianqiang Jiang, General Manager of Duoli Technology Group.

Only 10 years after the company's founding, internal discussions began. One thing soon became clear: "This future technology is megacasting," says Jiang. Tesla, which introduced integrated die casting and redefined the construction of the body-in-white, was the wake-up call, according to Jiang. Once again, everything proceeded at supersonic speed. Projects were approved in 2020, the first Bühler Carat 610 and 920 machines were ordered in 2021-2022, and production began at the Yancheng plant in 2023. The Changzhou plant is the next milestone.

Due to its proven expertise in aluminum die casting, Duoli selected Bühler as its strategic partner and sole supplier for this realignment. "Although die casting was initially uncharted territory for us, there are already highly developed technologies and teams in this field. We had to react quickly, and Bühler, as a leading provider, was the partner of choice," explains Jiang.

Revolutionizing vehicle construction

With the help of megacasting, innovative car manufacturers and suppliers are revolutionizing vehicle construction. Up to 100 individual parts, which previously had to be welded together by hundreds of robots, can now be cast in one shot in aluminum.

The Carat 920 at Duoli's Changzhou plant. The die-casting cell is as big as a house, and the construction work is not over yet – the space for the next Carat 920 is already being prepared.

This brings enormous efficiency gains in production and a significantly improved environmental footprint. Fewer individual parts mean fewer assembly and joining processes. This means that a complete body part can be cast in just 100 seconds. It also means simplified supply chains, which reduces logistics costs, and less material used improves the environmental footprint of the finished product.

These structural parts – such as the front and rear underbodies – reach previously unheard-of dimensions, with shot weights of up to 100 kilograms. Understandably, this new weight class requires new machines that also surpass all previous models in terms of clamping force, dimensions, and weight.

To equip the new factory in Changzhou, Duoli ordered four of the Carat 920 giants from Bühler at the beginning of 2024 – each as large as a single-family home. First introduced to the market in 2023, Bühler's solution quickly established itself as the leading option – orders from Volvo, Honda, and four other original equipment manufacturers (OEMs), have since been placed with Bühler. The Carat 920's performance stands out thanks to its unique two-platen technology, digitalization, and the integration of peripheral devices. In Changzhou, the first Carat 920 had already been set up and was operational in early January 2025.

No room for adjustments

However, it's not only the machines that are enormous – the demands on the unit, processes, cell, and tooling design have also increased significantly. It starts with the setup. While smaller machines can be assembled, tested, disassembled, and then reassembled on site at the customer's facility, this approach is impractical for machines of this scale. Every detail must be meticulously coordinated and simulated in advance to prevent any unforeseen issues during installation.

"With cell solutions and machines with a locking force of 6,000 tonnes, everything has to fit seamlessly right from the start. The smallest mistakes would have costly consequences and a major impact on the project timeline and the start-up process," says Cornel Mendler, Managing Director of Bühler's die-casting business.

Due to the immense forces involved, even the installation site and foundations require a new level of quality. In just 80 milliseconds, up to 230 kilograms of molten aluminum are pressed into the 200-tonne mold, with hydraulic pressures of 210 bar and forces of 92,000 kilonewtons. This force is enough to lift the Eiffel Tower – not once, but every 100 seconds. Ultimately, up to 1,000 parts are to be produced per day, with wall thickness precision to within a few tenths of a millimeter. Nothing must give way or deform; the machine must operate with absolute precision and repeatability in the casting unit. The foundations are therefore up to 30 meters deep, with the surface ground so flat that the height difference across the entire area is less than a millimeter. "Even a minor installation error can lead to large deviations. There's no room for adjustments with the Carat 920, so the foundation must be absolutely precise," says Robin Lu, who heads Bühler's die-casting business in China.

Above all, the processes must be as perfectly synchronized as a Swiss watch. At these production volumes, an aluminum furnace is needed directly next to the machine, along with robot-controlled handling of the heavy parts, a cooling basin, and immediate optical quality inspection before the part moves on for further processing.

Over 20 peripheral devices need to be coordinated. This is managed through Bühler's powerful DataView machine control, which integrates all process-related and quality-relevant peripheral devices. It is supported by Bühler's SmartCMS, a higher level of control that orchestrates the entire cell.

When the first Carat 920 was powered up at the Changzhou plant in early January 2025, the team was able to rely on their experience of working with the smaller Carat 610 in Yancheng. For almost 2 years,

Duoli and Bühler signed the new contract in early 2024, kicking off the successful collaboration between the two companies.

"WE WANT TO BECOME THE LARGEST MEGACASTING PRODUCER IN CHINA. AFTER THAT, WE'LL EXPAND OUR BUSINESS GLOBALLY."

JIANQIANG JIANG
General Manager of Duoli Technology Group

VIDEO
Watch this video to learn more about Duoli's megacasting journey.

Duoli has been producing body parts for automakers in Yancheng using the megacasting process. They produce around 600 parts a day. "Bühler has met all agreed specifications," says Jiang.

Building on success

Motivated by these successes, Duoli and Bühler are working together on further improving the parameters. "We want to increase production to 800 parts per day," says Sun Jianxin, who is responsible for production at Duoli. He joined Duoli from an OEM with his team. In his previous position, he managed several factories and knows what it takes to optimize production. "Our teams work together excellently," he explains.

In the medium term, Jiang expects further progress as more experience with megacasting accumulates. "We are still at the very beginning," he says. "Most of the costs in megacasting are determined by the design of the parts. We had to develop a deep understanding of the entire process chain, from post-casting finishing to equipment maintenance."

A thorough understanding of these points is essential to further increase efficiency and reduce costs. But anyone who has come to know Duoli has no doubt about the company's ability to implement these operational principles. The company's long-term strategic direction is no surprise either: "We want to become the largest megacasting producer in China," says Jiang. "After that, we'll expand our business globally."

INFO

Duoli Technology Group

Shanghai, China

Founded in 1998.

Duoli is a Tier 1 original equipment manufacturer (OEM) supplier with stamping, welding, die-casting, and thermal forming business.

The company serves many well-known global OEMs in the domestic car manufacturing industry.

Duoli has Carat 610 and Carat 920 die-casting solutions from Bühler.

IN IT TO **WIN IT**

A Bühler service technician inspects a roller mill at a customer site.

TEXT: BURKHARD BÖNDEL
PHOTO: EHRIN MACKSEY

Saving energy, cutting costs, reducing CO_2 emissions – all without risk for the customer? Bühler is taking a bold step forward with a new service model: Outcome as a Service (OaaS) offers customers measurable savings that are only paid for when they are realized. Bühler's first projects show that it works, and the future of industrial efficiency is based on partnerships.

ENERGY IS A KEY FACTOR in industrial processes – both economically and ecologically. This also applies to milling: "One of the most important KPIs of a milling operation is electricity consumption per tonne of flour," explains Martin Stäger, Head of Service Transformation at Bühler. In well-maintained and well-managed systems, this value is between 50 and 75 kilowatt hours (kWh) per tonne of wheat. It is a significant cost factor and a lever for optimization.

The better the system is maintained, adjusted, and operated, the more efficiently it runs and the less energy it requires. "In many cases, we can reduce consumption by up to 10 percent," says Stäger. An example from a customer in Greece shows savings of up to 15 percent, resulting in lower costs, reduced CO_2, and improved processes.

The new approach is results-based

With its new Outcome as a Service (OaaS) model, Bühler is taking service to the next level: the focus is not just on the service provided, but also on the impact on operations as a result of the service, such as energy saved. "The customer only pays for the service if we achieve the promised effect," explains Livia Höhener, Head of Customer Service Europe at Bühler. "This means we deliberately assume part of the risk."

OaaS has a modular structure. It begins with a discovery session at the management and the production management level in which strategic goals and possible levers are discussed. This is followed by a technical assessment of the plant on site, including an analysis of process parameters, electrical systems, and automation potential.

This is followed by implementation and continuous fine-tuning during operation. The measures range from retrofitting more efficient motor controls and optimizing the aspiration system to automating entire sub-processes. "In one example, we replaced two old machines with a new one, which not only improved performance but also saved a significant amount of energy," explains Höhener.

Real success and real partnerships

Even minor interventions have an effect. Incorrectly set filter pressure or poorly maintained rollers cause unnecessary energy use. This can be rectified relatively easily. Bühler not only draws on process and technology expertise, but also uses its own digital platform Bühler Insights. This creates transparency about ongoing operations and pinpoints deviations at an early stage.

The example from Greece highlights the potential. Two mills with a combined capacity of around 300 tonnes per day were analyzed and optimized. The result was an annual reduction of 234 tonnes of CO_2e and more than 400,000 kWh of electricity saved. "What's crucial, is that these savings have a direct impact on the customer's profit margin," explains Stäger. "They also help make the mills more future-proof."

But the financial aspect is only part of the story. The model establishes a new and innovative form of collaboration. Bühler and the customer act as true partners, working side by side with a common goal and shared responsibility. "It's no longer just about spare parts, service, and routine maintenance," says Höhener. "It's about enhancing business performance and improving outcomes together."

OaaS is currently still in the pilot phase. The learnings and experiences gained from the first projects are very promising. "Outcome as a Service is a model for the future," says Höhener. "What is really unique about it is that it combines benefits for the customer's business with innovation. It enables their profitable growth while at the same time minimizing their footprint in terms of emissions, energy, waste, and water."

BENEFITS

With Outcome as a Service (OaaS) you can:

+ pay only for measurable savings achieved, such as reduced energy use, lower costs, or cut CO_2 emissions;
+ rely on Bühler to share the risk by focusing on jointly achieved results;
+ benefit from a modular approach that includes technical upgrades, process optimization, and digital platforms such as Bühler Insights;
+ achieve proven results with energy savings of up to 15% and noticeable reductions in operating costs.

Find out more about Outcome as a Service:

FOOD FOR THOUGHT

BRAINS & BYTES: WORKING AND LEARNING WITH AI

Matthias Graeber, Head of Data Science at Bühler

SINCE CHATGPT launched in November 2022, the field of Artificial Intelligence (AI) has evolved at a breathtaking speed. AI is no longer a futuristic concept; it's here, and it's rapidly reshaping how we think, work, and learn. At Bühler, we are embracing this transformation by using AI to enhance the way we operate and how we support our customers around the world. Our approach is grounded in purpose: we start by asking "Why?" – and only then ask, "Why AI?" Technology for technology's sake has never been our goal. Instead, we focus on how AI can deliver meaningful value and strengthen human potential. Because the incredible rate of AI inventions does not guarantee innovation per se. True innovation requires purpose, commercial value, and industry adoption.

As a result, AI now plays a growing role in our products and services. In flour milling, we've integrated decision-support agents that collaborate with human operators. They ensure consistency in production and optimize energy usage. This type of human-AI partnership improves operational outcomes but also contributes to resource efficiency. Similarly, in our optical sorting machines, AI is built directly into the systems, enabling real-time decision-making with deep neural networks. This embedded intelligence enhances accuracy and reduces product losses – critical factors for food safety and profitability. Internally, we have trained thousands of employees. As a tech-minded company, this sparked strong demand. Over 6,000 employees regularly use Bühler Chat, our secure ChatGPT instance, to boost efficiency across many applications.

Bühler's quality assurance teams are another example. With automated translation, summarization, and categorization of customer feedback in over 10 local languages, teams can rapidly get to the heart of a quality issue. This enables our experts to do what they do best: to find the root cause and develop long-term, sustainable solutions.

Rather than replacing human intelligence, AI thereby becomes a powerful support system that frees up time and energy for tasks that require deeper analysis and innovation.

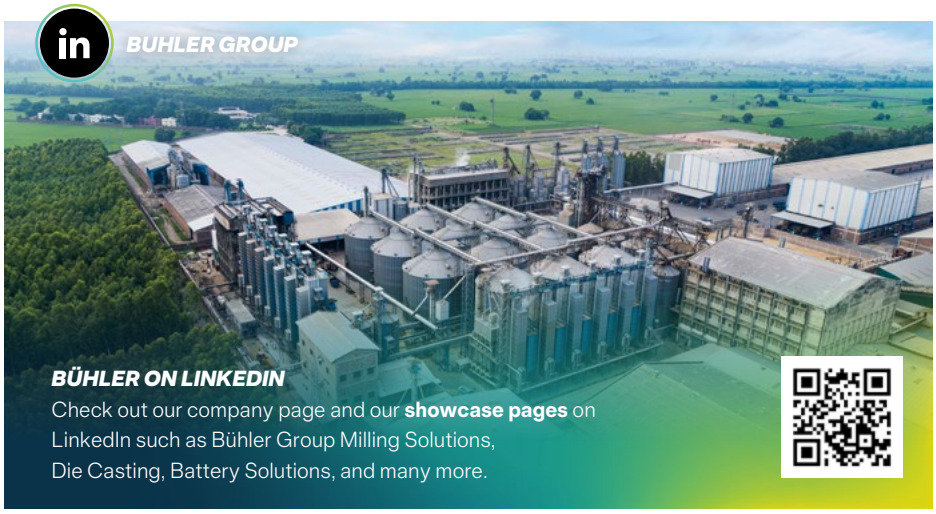
The capabilities of AI are evolving rapidly. Today, cutting-edge AI models outperform even top university students on Master-level exams across various disciplines. But it's important to emphasize that AI is not here to replace people – it's here to empower them. What machines still lack are uniquely human traits like emotional intelligence, empathy, and creativity. These skills represent depth, judgment, and contextual understanding that machines cannot (yet) replicate. This raises an important question: What about knowledge and learning? Will our reliance on AI make us mentally lazier or less capable? Some have drawn analogies using nature. For instance, domestic horses have a 14 percent smaller brain capacity than wild horses, which some interpret as a metaphor for potential human skill degradation in the age of AI. However, the reality is more nuanced – and more optimistic.

There is growing evidence that AI can enhance human learning and development rather than diminish it. A recent Stanford and MIT study showed that call center agents using AI performed better not only while using it but also when the system was down. This suggests AI can act as a teacher or mentor, helping people develop and retain better habits and approaches. The AI didn't just help them – it trained them. Human-AI collaboration offers an exciting opportunity to support people on their lifelong learning. If implemented thoughtfully, AI can augment – not replace – human intelligence. With proper training and design, AI can be a catalyst for continuous development, enabling people to adapt to new challenges more effectively and confidently.

At Bühler, we are mindful of how we integrate AI. By balancing brains and bytes, we can create solutions that serve the industry and support our teams, values, and shared future.

LET'S GET SOCIAL!

Stay up-to-date with the latest trends, innovations, and customer success stories from the Bühler world by following us on our social media channels. You are also welcome to tag us in your posts about how you work with our solutions.

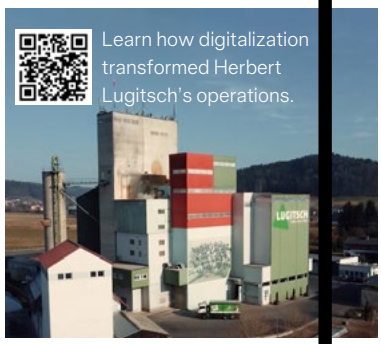


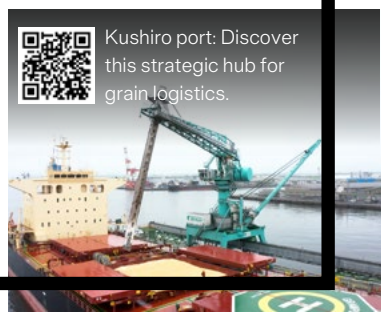
THE BÜHLER INSPIRATION HUB

Would you like to know more about the key trends impacting your industry? Visit our Inspiration Hub, where you will also find features and videos highlighting the inspiring work of our customers and partners around the world.

WHAT'S HOT?

Check out two of the most popular videos on our YouTube channel.





YOUR OPINION MATTERS TO US

We would love to hear what you think of Diagram so that we can make it even more relevant for you. Please send your feedback to:

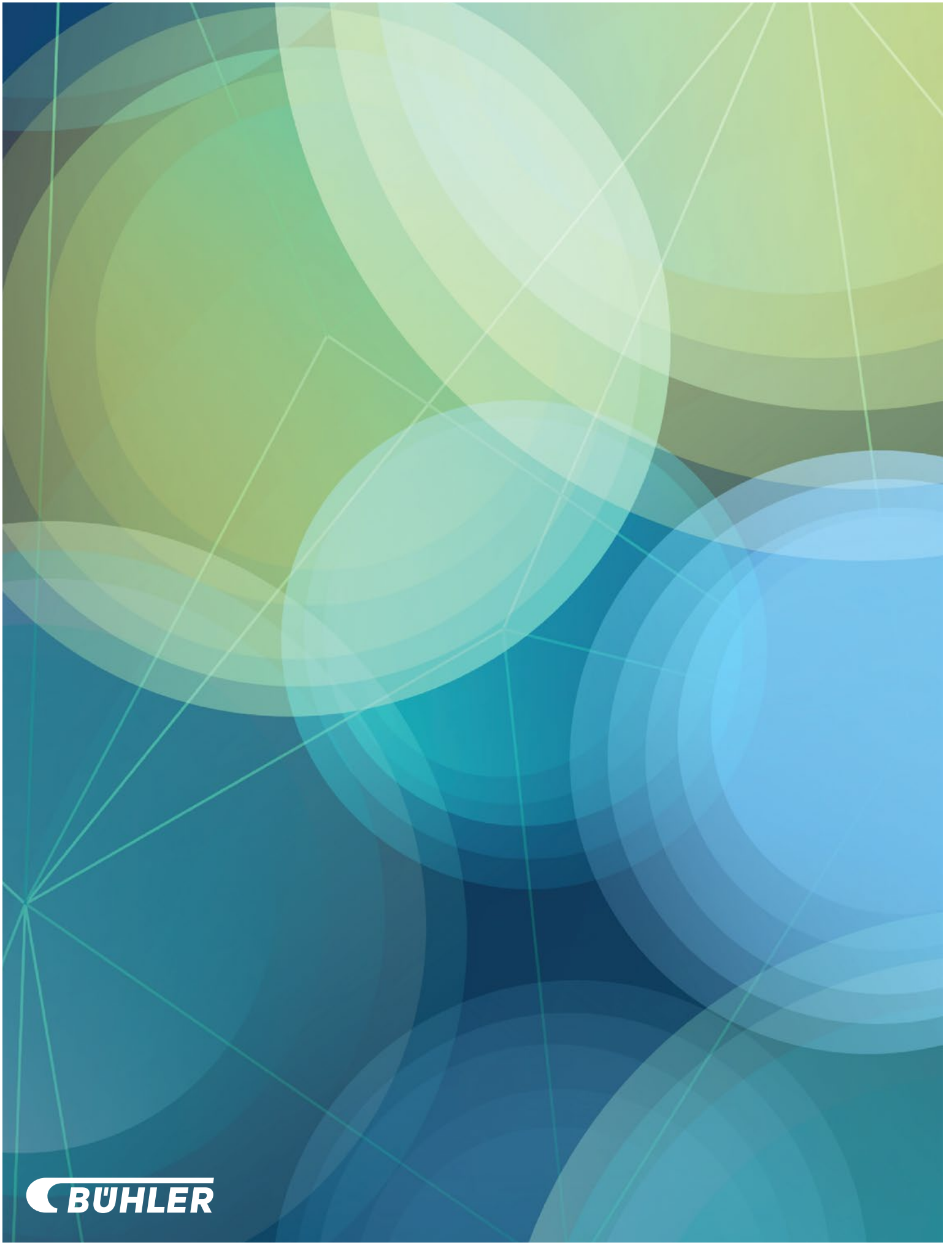
media.relations@buhlergroup.com

IMPRINT: *DIAGRAM 190 / JUNE 2025*

Published by Bühler AG, Corporate Communications, 9240 Uzwil, Switzerland. Email: media.relations@buhlergroup.com. **Editor-in-Chief:** Michèle Bodmer. **Senior Editor:** Janet Anderson. **Editors:** Lukas Hofstetter and Bianca Richle. **Project Coordination, Design & Layout:** Jekaterina Gluzman. **Design & Layout support:** Artismedia, Stuttgart, Germany. **Copy editing:** comtexto AG, Zurich, Switzerland. **Printing:** Galledia Print AG, Flawil, Switzerland.

MIX Paper | Supporting responsible forestry FSC® C011710

Print product with financial climate contribution ClimatePartner.com/53173-2505-1003


BÜHLER