

# diagram

#182 / August 2021

the Bühler magazine



*connecting ...*

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## IT'S TIME TO SWITCH TO GROWTH MODE

BÜHLER'S BUSINESSES ARE  
READY TO ENERGIZE YOU

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## INNOVATION IS IGNITED IN CRISIS

WHY UNCERTAINTY AWAKENS  
CREATIVITY AND ENGAGEMENT

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## CAMERA ROLLING? WE'RE LIVE!

HOW REMOTE TRIALS SPEED  
UP PRODUCT DEVELOPMENT

A vibrant street scene in a European city, likely Zurich, featuring colorful buildings, flags, and people. The street is lined with multi-story buildings in shades of pink, blue, and yellow. Numerous flags, including the Swiss flag and various European national flags, are flying from poles along the street. In the foreground, the backs of two people are visible, looking down the street. A person wearing a blue helmet is riding a bicycle in the middle ground. The overall atmosphere is bright and lively, suggesting a sunny day.

# *connected!*

The pandemic turned our usual routines upside down, but as lockdowns in many parts of the world ease, it's becoming possible to reconnect, rekindle friendships, see loved ones, and learn to thrive in the next normal. As people go out and expand their horizons, spending will rise, and economies will rebound. We hope that around the world, situations will improve swiftly, and everyone can experience the joys of life as it should be.





July 2021: Rennweg is a popular promenade in the heart of Zurich's old town. Looking over Rennweg is St. Peter's parish, with the largest church clock face in Europe.



# *ener*





# gized

**DEAR READERS,** I feel energized and optimistic. I am motivated by the fact that many countries, including my own, are reopening step by step, allowing people to connect again and experience the joy of what we very likely took for granted before 2020.

Restaurants, gyms, shops, sporting events, and more are back in Switzerland – yes, things are different from 2019, with the need to show proof of vaccination or a negative test result to take part in many activities – but the energy of this reconnection, this taste of pre-pandemic life, make it somehow so much sweeter than in the past.

Walking through our factories and offices in Switzerland, I feel the energy of everyone at Bühler. We are holding events in our CUBIC innovation campus again, and in June we even hosted a One Young World Switzerland Caucus with nearly 100 participants attending in person and 150 virtually. These young people are ready to change the world, and their energy motivates me to tackle the challenges ahead.

While I am optimistic, I am fully aware that some countries are in very different positions due to the Covid-19 crisis. It is my sincere wish and hope that all those who are still facing more challenging times will soon be able to experience the joys of safely reconnecting with people. One thing I am certain of is that when this does happen, we will emerge stronger. The coronavirus may be with us for years, but we are learning and growing, and will continue to gain the knowledge we need to get through this, and thrive again as individuals, societies, economies, and businesses.

The pandemic has brought about many changes in the way we do business, and has accelerated major trends that were already underway. Some of the fundamentals of business have changed extremely fast. Coronavirus has shown us how agile we must be and how fast opportunities come, but also how fast they are gone. As vaccination programs gather pace around the world, businesses are turning their attention to planning for the post-pandemic economy, asking: What shape will the recovery take and how will it emerge in different sectors? Only time will tell. In this issue of Diagram, you will discover the views of two renowned economic historians and find out if taking a look at how past pandemics have ended can give us some clue of what's to come.

During the last global financial crisis, the US-based entrepreneurial think tank, the Kauffman Foundation, published research revealing that 57 percent of the companies in the 2009 Fortune 500 were launched during a recession. In this issue, we ask experts how innovation is ignited through crisis. One of their findings is that the priority for businesses now should be to ensure they have a clear corporate purpose, serving society, not exploiting it, and treating their employees and customers well. I take great inspiration from the interview in this issue with Peter Bakker, CEO and President of the World Business Council for Sustainable Development. His exchange with our CTO Ian Roberts is a must-read on how, together, we can all contribute to protect the environment and reduce social inequalities while increasing our competitiveness. As he says, now is the time to transform, and a shift in mindset is needed to see this through.

At Bühler, we can already see this trend in action. Whether it is energy efficiency, CO<sub>2</sub> reduction, waste reduction or up-cycling, we see global players coming to us and asking for solutions, wanting to co-develop applications, and change their operational system to a more sustainable one.

As our CEO of Advanced Materials and Chief Services & Sales Officer – Group Samuel Schär describes it in an interview in this issue: “We have had many exchanges with our customers during the pandemic and have therefore reconfirmed that we can learn so much from each other no matter what. You pick up something from another company and you mix it with your own activities and then you can give it to somebody else. It's this network that future-proofs us all.”

Let's use this crisis to reframe our purpose with the focus on new, transformative solutions and mindsets. Though we continue to cope with this pandemic, and the potential is high that it won't be our last, it is optimism for a better future that will guide us to do our best for our businesses, society, and the world – it's time to get ready for growth.

Yours sincerely,



Stefan Scheiber, CEO Bühler Group



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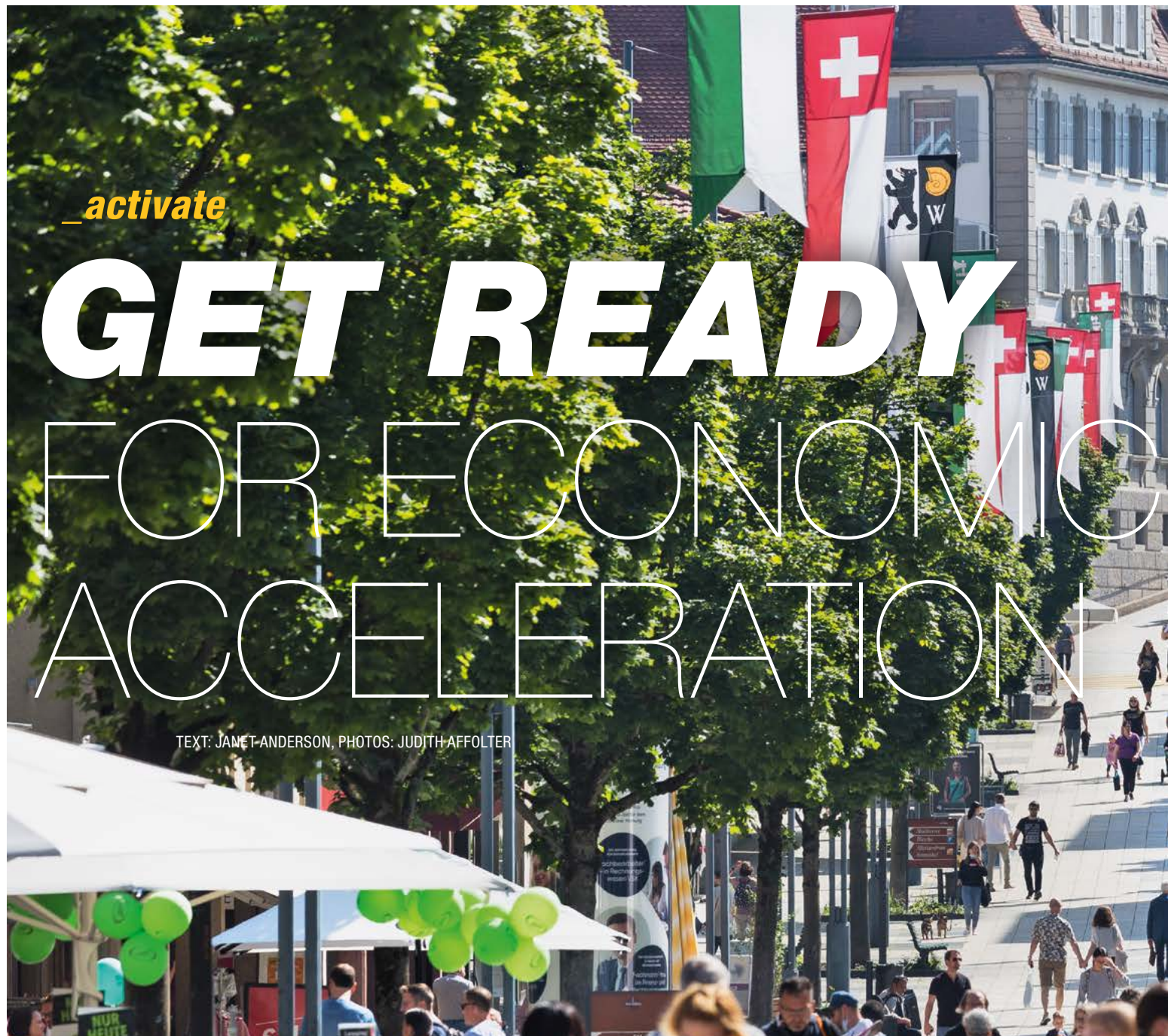
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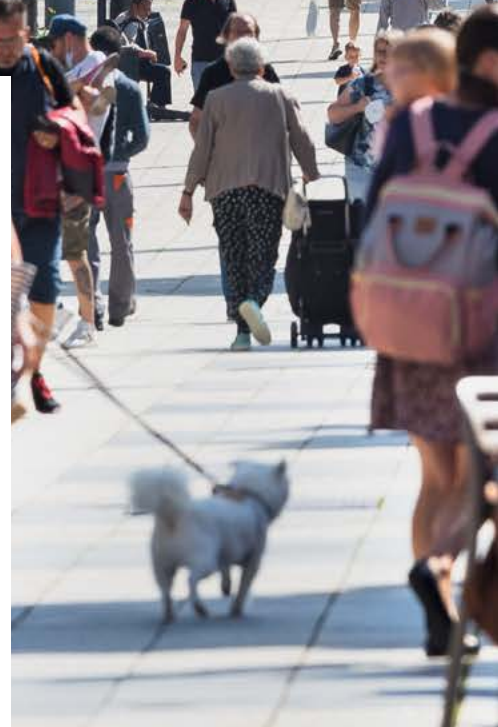
*\_activate*

# GET READY FOR ECONOMIC ACCELERATION

TEXT: JAMIE-ANDERSON, PHOTOS: JUDITH AFFOLTER

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*As vaccination programs gather pace around the world, businesses are turning their attention to planning for the post-pandemic economy. What shape will the recovery take and how will it emerge in different sectors? We don't have a crystal ball, but a look at how past pandemics have ended can give us some clues. One thing is for sure, energy and optimism are on the rise – it's time to get ready for growth.*







July 2021: The charming town of Wil has one of the best-preserved old towns in Eastern Switzerland. The Obere Bahnhofstrasse pedestrian zone, with its many shops and restaurants, leads to the picturesque old town.



**IF THE EXPERIENCE** in the United Kingdom (UK) is anything to go by, the pandemic will end in a shopping spree. In the days immediately after lockdown restrictions were relaxed in April 2021, queues formed outside stores and retail sales surged. After months of online shopping, people were keen for real-life experiences. Demand for hotels, restaurants and other consumer-facing services all soared and factory orders grew at record pace. Business confidence hit a record high, according to figures released by the Confederation of British Industry, as the rebound proved better than expected. Forecasters are predicting gross domestic product (GDP) growth in the UK of 6 percent or over.

A feeling of optimism is emerging in many places around the world. In Germany, which is behind the UK in terms of its vaccination program, business confidence is rising across all sectors, reaching its

highest level since May 2019, according to the Ifo Institute in Munich. The Organisation for Economic Co-operation and Development (OECD) said in May 2021 that it sees the economic outlook brightening and global growth continuing to recover, bringing the world back to pre-pandemic levels by the end of 2022.

Of course, caution is still called for. Any hint that the pandemic might not be under control is likely to send those same shoppers straight back home again. There are also fears of higher inflation with commodity prices rising and supply chain bottlenecks in some sectors. Are we in for a roller coaster ride? A look at how past pandemics have ended and the effects they had on economies around the world can give us some clues as to what to expect. From the perspective of an economic historian, a great deal of human history can be explained by the effects of



***“PEOPLE WANT TO GO OUT AND TOUCH STUFF AND RUB SHOULDERS AND FIGHT FOR SPECIAL OFFERS AT STORES. YOU CAN SEE EVERYONE WANTS TO GO OUT AGAIN.”***

**ALBRECHT RITSCHL**

Professor of Economic History at the London School of Economics

#### ALBRECHT RITSCHL

**Albrecht Ritschl** is Professor of Economic History at the London School of Economics. He is an internationally renowned expert on debt crises, financial crises, historical business cycles, macro-economic history, and monetary history. He was previously Professor of Economics at Humboldt University, Berlin, and at the University of Zurich, and was Associate Professor of Economics at Pompeu Fabra University. He is a Fellow at the Centre for Economic Policy Research (CEPR), the Centre for Economic Performance (CEP), and the independent research network, CESifo. He is also a member of the Scientific Advisory Board to the German Ministry of Economics and has published extensively on German economic history in the 20th century, with a focus on the 1930s.

pandemics on societies. The bubonic plague, commonly known as the Black Death, had a profound impact on Renaissance Italy, while attempts to stem the spread of typhoid in the late 19th and 20th centuries led to significant improvements in water quality in many regions. The cholera pandemic in France in the 1830s was followed by a period of economic revival as well as huge structural change.

#### **Rare events that create major change**

Plagues have shaped the history of nations, sometimes causing societal upheavals and sometimes leading to rapid growth and innovation. It is argued that the plagues that Europe suffered over centuries were paradoxically the cause of long-lasting improvements in living standards and real wages.

When looking for clues as to how Covid-19 will affect our societies and economies in the mid- to long-term, it pays not to look too far back in history. The 1918 flu pandemic – also known as the Spanish







July 2021: The Marktplatz in the city of St. Gallen is again bustling with activity.

flu, as the Spanish press was the first to report it – is the best analogy, says Albrecht Ritschl, Professor of Economic History at the London School of Economics. It was the most severe of the three influenza pandemics of the 20th century, estimated to have caused 20–50 million deaths in 1918–1919. Although the aftermath of the First World War hampered recovery, there are lessons to be learned from how the disease was tackled and its impact on economies.

“The effects were big and differed by locality and policy response. Governments and municipalities tried to find a response. Likened to today, they varied a lot, from complete lockdown to almost complete denial,” says Ritschl. This means we can link economic responses to these policy responses. “In general, what we find is that the economic rebound was stronger, more pronounced, and more sustained in areas that had locked down early and hard,” Ritschl explains.

The historical evidence shows that although some places were revisited by the Spanish flu, good habits had been trained early on, so when a second lockdown became necessary, everybody knew what to do and the impact of repeat waves was not as strong. It’s not just the impact on the immediate vicinity that is evident.

In the case of the Spanish flu, we see how lockdowns and disruption have ripple effects across space because supply chains are affected. “Madrid goes into lockdown, economic activity is disrupted, this carries over into other provinces where the

epidemic is not so strong but precautionary measures are being taken and supply chains are disrupted,” says Ritschl. “The strength of the economic fallout is pretty much like we see it today – output declines 5 or 10 percent on impact then grows back but falls again when the next wave strikes.”

### The same, but different

The Spanish flu affected a third of the world’s population, making its way through Europe, the United States and Africa, into Australia and South America. When the fourth wave finally subsided, it was followed by a period of astonishing economic growth. Many historians have argued that the vigorous recovery in the United States in the 1920s – known as the Roaring Twenties – may have been a rebound effect to the Spanish flu. It is hard to say for sure, as other factors were at play. But some are arguing that we might see a similar effect in the coming years as our economies recover from Covid-19.

There is, however, a major difference between the Spanish flu and Covid-19 in that our response to the epidemic is more intense and systematic.

“The difference between the historical evidence and what we see now is that back then there was not the same level of income support by the state. We have had this very strong public response in terms of income support, which means the macroeconomic response pattern to the crisis is different,” Ritschl says. “Generous government programs in many countries today seem to have led to a pile-up

of savings. We see lots of saving by those who in 1918–1919 would have been hardest hit by the crisis with unemployment and shutdown of businesses. Public policy has been geared to income smoothing – to ride out shock – with quite some success.”

The second major difference is the age profile. The Spanish flu hit people of prime working age – young adults age 22 to 35 – whereas the global death rate for Covid-19 is highest among the 60-plus age group. In that sense, the effect of the Spanish flu was worse for the economy, in particular the labor market, than Covid-19. In some senses, the current pandemic has seen a return to a pattern that used to be familiar throughout much of human history. “We have seen the return of pandemic-driven business cycles. This used to be normal economic life for tens of thousands of years. Since agriculture was invented, we’ve seen waves of pandemics ripping through human populations, dominating economic activity because they dominated mortality,” says Ritschl.

On the other hand, what we are seeing now is nothing more than a faint echo of previous crises. Whereas the mortality rates for Covid-19 are currently on average just over 2 percent according to Johns Hopkins University data, the bubonic plague killed 30 to 40 percent of those infected. So too did smallpox. The last pandemic of the plague was in the early 20th century in Southeast and South Asia and cost millions of lives. In terms of history, we are not that far from it. But now we have antibiotics and can stop these diseases in their tracks. The same is true of cholera, where public hygiene improvements mean we can stem the spread.

Nevertheless, what we have learned through Covid-19 is how disruptive a pandemic is economically. But we have also seen that the onset of modern economic growth probably had much more to do with the disappearance of epidemics than we realized, says Ritschl.

### **A roaring recovery?**

With vaccination programs underway around the globe and governments providing trillions in financial support, how will the recovery play out? A recent survey of CEOs worldwide carried out by PwC suggests that most are bullish about the economic outlook. The pandemic has unleashed energy and creativity, as leaders seek out enduring solutions to problems, argue the report’s authors. It will accelerate digital transformation, amplify disruptive forces and bring improvements in productivity – adding as much as 3.9 percent to the baseline figure, according to recent analysis from Goldman Sachs.

Of the CEOs surveyed by PwC, 76 percent said they believe the economy will improve during the next 12 months. In terms of optimism, this is a record – nearly 20 percentage points above than the previ-

ous high. In terms of revenue growth prospects for their own organizations, 36 percent said they were very confident for the next year, and 47 percent were very confident looking three years ahead.

Based on this, PwC estimates global growth could rise by 5 percent and return to its pre-pandemic size by the fourth quarter of 2021 or early 2022. Many experts agree, however, that the recovery will be uneven across sectors and countries. It is not only the discrepancies in access to immunization that make the difference. Different sectors face different paths out of the pandemic.

“It will be a mixed picture, with some businesses benefiting from a significant bounce back and others struggling with debt and continuing uncertainty. The aggregate figures might well be very positive but there will be plenty of bad news too and it’s important to recognize the difficulties of transitioning to a



**DIANE COYLE**

**Diane Coyle** is Bennett Professor of Public Policy at the University of Cambridge and Co-Director of the Bennett Institute. She heads research under the themes of progress and productivity. She was previously Professor of Economics at the University of Manchester and in 2018 was awarded a CBE for her contribution to the public understanding of economics. She has been a government adviser on economic policy, including throughout the Covid-19 pandemic, and is a Director of the Productivity Institute, a Fellow of the Office for National Statistics, and expert adviser to the National Infrastructure Commission. Her book, “Markets, State and People – Economics for Public Policy”, looks at how societies reach decisions on the use and allocation of economic resources.





***“AS SOON AS YOU RELEASE  
BRAKES, THE WHOLE  
ECONOMY ACCELERATES.”***

**ALBRECHT RITSCHL**

Professor of Economic History at the London School of Economics

July 2021: Zurich's Paradeplatz is at the busy intersection between the lake, the old town, and the famous Bahnhofstrasse shopping district and financial center.



July 2021: Zurich's historic Sechseläutenplatz is one of the largest city squares in Switzerland. This popular pedestrian zone is adjacent to the Lake of Zurich and near a popular shopping thoroughfare.



more normal state of economic activity,” says Diane Coyle, Bennett Professor of Public Policy at Cambridge University.

For example, whereas technology companies are very optimistic, there is still a great deal of uncertainty in tourism. “We aren’t in the clear in terms of infection waves, nor will we be until every country is largely vaccinated. There will be a question of debt resolution, and how to achieve it as fairly as possible, supporting people who have been hammered by the pandemic while avoiding having the debt cloud loom for years,” Coyle explains. “This is corporate debts to governments and banks, but also personal debt. Consumers can’t spend if they have rent or mortgage arrears.”

That is undoubtedly the case, but the signs are that the world is getting back on its feet. “Initially I thought the recovery would be L-shaped, that we would plunge into a recession and have a hard time

getting out of it,” Ritschl explains. “The reason this didn’t happen is the very strong public intervention.” Because of the flood of public money, some thought the recovery would be swoosh-shaped, but Ritschl was skeptical. He predicted a W-shaped recovery, which has broadly turned out right.

“We’re coming out of the second trough now,” he says. “It seems the third wave has been broken by the vaccination campaign, but we still need to see what happens. We can cautiously assume that in Europe and North America we will be able to put it behind us. But until 70 to 80 percent of the world’s population have either had Covid-19 or been vaccinated, there will still be a lot of uncertainty.”

So, we can expect some zigzagging for a while. For example, airline bookings went through the roof when travel was allowed, then stagnated and there were lots of cancellations when people realized it wasn’t going to go so fast. But it won’t be like this



***“GOVERNMENTS NEED TO TREAD CAREFULLY AND NOT WITHDRAW FISCAL SUPPORT TOO QUICKLY. THE BEST WAY THEY WILL REDUCE THE PUBLIC DEBT BURDEN IS BY ENSURING THEIR ECONOMIES ARE GROWING AGAIN.”***

**DIANE COYLE**

Bennett Professor of Public Policy at the University of Cambridge



forever. “I think it’s safe to say that as soon as travel restrictions are lifted, travel will normalize. People want to go out and touch stuff and rub shoulders and fight for special offers at stores. You can see everyone wants to go out again,” says Ritschl. “We had our first pint standing outside a pub – everyone had the greatest time.”

Some things, however, are likely to remain, such as using video conferencing much more than in the past as this creates savings and efficiencies. Goldman Sachs believes that it’s not just video conferencing that is here to stay. They also see gains in productivity being made through acceleration of e-commerce and believe empty office space could be repurposed in more profitable ways. The International Monetary Fund (IMF) said in April that it now expects the global economy to grow 6 percent in 2021, as economies adapt to new ways of doing things.

All upheaval has its costs. While the IMF agrees that the crisis has accelerated the transformative forces of digitalization and automation, it warns of the effects this could have on young and lower-skilled workers. The IMF is also worried about divergent recovery paths. Although swift policy action worldwide meant that a financial crisis was averted, they expect emerging markets and low-income countries to suffer greater scarring.

#### **Confidence counts**

Against this backdrop, Coyle believes the priority for businesses now should be to ensure they have a clear corporate purpose, serving society not exploiting it, and treating their employees and customers well. “The appetite among the public not to return to ‘business as usual’ is tangible. If business as a whole doesn’t respond to the significant change in mood, there will be more regulatory intervention. The era of letting the ‘free market’ get on with things is drawing to a close,” she believes.

But the recovery of confidence is of paramount importance. “Confidence is everything after an experience like the one we’ve all had since early 2020,” Coyle explains. “This is exactly why governments need to tread carefully and not withdraw fiscal support too quickly. The best way they will reduce the public debt burden is by ensuring their economies are growing again.”

Ritschl agrees but acknowledges how tricky it is to create confidence. “Confidence is as shy as a roe deer – the slightest sound and it disappears,” he says. “Yet as soon as there is quiet on the Covid-19 front, it comes out again. That’s what we are seeing in Britain right now. There is a strong rebound effect. People have the impression Covid-19 is over, they want to go out and shop, party, and invest.”

In the long term, Ritschl believes people are expecting a return to normal – they don’t expect a lasting dent, they expect a full recovery. “The last time the sentiment indicators were this good was in the 1960s. As soon as the news is positive, confidence goes through the roof. As soon as you release brakes, the whole economy accelerates.”

***\_invigorate***

# NOW'S THE TIME TO SWITCH TO **GROWTH MODE**

INTERVIEW: MICHÈLE BODMER  
PHOTOS: JEKATERINA GLUZMAN

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*The pandemic has brought about many changes in the way we do business and accelerated major trends that were already underway. We spoke to the CEOs of each of our businesses about what they have learned over this period, where they see new opportunities, and what they recommend to their customers to get ready for the future.*



**JOHANNES*****CEO GRAINS & FOOD*****WICK**

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**What's the most important lesson that you have learned during the pandemic?**

Some of the fundamentals of the business changed extremely fast. It showed us how agile we have to be and how fast opportunities come, but also how fast they are gone. Before, the world developed in a linear way, but this pandemic has created some fundamental changes in terms of where the markets are, how you have to address them, what solutions you need to bring, and how you have to communicate with customers.

**Which trends have been accelerated in your business?**

The ones that everybody has seen are increasing: automation, digitalization, and remote work. Prior to the pandemic, we were still having discussions with a few customers about whether connectivity is really a good idea, whether it is more a security issue than a support. But during the pandemic, the more you were connected, the more you could provide remote service, the better you could assist your customers. Even in these industries that are, in some ways, very traditional, it gave this discussion a boost.

***“IN THE NORTHERN HEMISPHERE, THE MAIN OPPORTUNITIES ARE IN SERVING THE INSTALLED BASE BETTER, DRIVING THE ALTERNATIVE PROTEIN WAVE, AND DRIVING SOLUTIONS FOR A MORE SUSTAINABLE FOOTPRINT. IN THE SOUTHERN HEMISPHERE, IT’S ABOUT WHO CAN PROVIDE THE MOST COST-EFFECTIVE SOLUTIONS THE FASTEST.”***

**JOHANNES WICK**  
CEO Grains & Food

On the animal protein side, the pandemic reinforced a message that had already been triggered by the African Swine Fever in 2019, that food safety and hygiene need to be at a totally different level. At that time, 50 percent of the pigs in China had to be killed. This triggered a wave of new investments in different types of feed plants. We are the market leader in this new type of feed mill. With the pandemic, this thinking has spread beyond China, and we are seeing these requirements coming everywhere, and I wonder whether this will become a requirement in food production more generally.

The pandemic has massively boosted the plant-based protein business, especially in the western world. The speed of investment going into this sector is extraordinary. And I think it’s lasting – I think the industry is undergoing a structural change. At Bühler, we have been working on this for over a decade. So, we were betting on this change. In that sense, the pandemic helped us to leverage our strategic investments from the past.

#### **Has the pandemic changed the importance of different regions?**

The pandemic has shifted the weights of different regions. China is the big winner. In terms of local supply and export, it’s unbelievable what we are doing there. We are the market leader in this most competitive market. Look at the grinding machines we are supplying for the milling industry. Bühler has been the leader in this for over 100 years.

For many decades, the total number of grinding machines/roller mills we delivered every year was 600. Last year, we delivered more than 3,000. That meant that in the second half of the year, we were delivering 20 roller mills a day. That is a 500-ton flour mill every 18 hours – more than one a day.

We have had to ramp up everything – production, supply chain, engineering capacity – throughout the year to get to this model. And we are still producing at this level.

#### **What about size – are people investing in solutions that are smaller?**

The main driver for our business before the pandemic was big projects. Since the pandemic started, these have disappeared. For instance, we have not seen any big investment into storage facilities or logistic facilities because global trade shrank. As such, we have switched to doing business with smaller projects, more machines, more retrofits, and more service. In some areas, the big projects will come back. In others, bigger capacities will be built but with less investment.

#### **Which other changes will stay after the pandemic?**

I think we will see less access to imported raw materials like wheat. I believe there is a structural change ongoing towards more local grain. The markets where the change is most dramatic are countries in the southern hemisphere, especially those that depend on oil and gas exploration. Countries such as Nigeria and Angola have less foreign currency to import wheat or rice. This means they have to shift gradually to more local grains, such as sorghum and millet, which is an interesting change for us.



**In terms of digitalization, will these changes stay?**

Absolutely. There are two parts. I think we will do more and more remote commissioning, and guide less experienced people on site remotely. And, of course, when it comes to optimizing existing assets, with connectivity, we will be able to assess and benchmark better plants and find out how the downtime can be improved.

**Where do you see those new opportunities?**

In the northern hemisphere, the main opportunities are in serving the installed base better, driving the alternative protein wave, and driving solutions for a more sustainable footprint with less CO<sub>2</sub> production. In the southern hemisphere, it's about who can provide the most cost-effective solutions the fastest, because the windows where the customers can invest have become much smaller. It's challenging for us, but we have everything to make it.

**How do you see customer interaction in the post-pandemic world?**

On one hand, we have realized how much you can do without traveling. With big organizations, I think this will stay, because digital tools allow you to have meetings with much bigger audiences. On the other hand, with small companies and family companies, where you have the discussion with the owner at the table, this has to come back and the sooner the better, because you cannot build such relations on the phone.

**What do you recommend that customers do to get future-ready?**

The first thing is to continue to invest. Many are hesitating and waiting until things are better. In most cases, I believe they will be late. Then the second is, of course, digitalization. Customers can still jump on this train of connectivity. What we offer tomorrow will be much better than what we offer today. And if they don't jump on the train now, they will miss what is available tomorrow and they will have a tremendous disadvantage. The third thing is they need to assess who their best partner is locally.

The pandemic has shown that you cannot rely on a supplier who has operations in only one location. This can kill your business. Customers need to build in some risk mitigation. Finally, I think awareness of climate change and CO<sub>2</sub> has changed dramatically. The longer you ignore it, the more costly it will be for you. I don't think big investments are necessary, but you need to understand your footprint now. And you need to understand what you can influence and where you can be better than your competition.



***"I THINK AWARENESS OF CLIMATE CHANGE AND CO<sub>2</sub> HAS CHANGED DRAMATICALLY. THE LONGER YOU IGNORE IT, THE MORE COSTLY IT WILL BE FOR YOU. I DON'T THINK BIG INVESTMENTS ARE NECESSARY, BUT YOU NEED TO UNDERSTAND YOUR FOOTPRINT NOW."***

**JOHANNES WICK**  
CEO Grains & Food

# SAMUEL

# SCHÄR

**CHIEF SERVICES & SALES  
OFFICER – GROUP,  
CEO ADVANCED MATERIALS**

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**What is the most important lesson that you have learned through this pandemic?**

This has been the biggest crisis since World War II for many of us. Sometimes we hear our grandparents, who lived through the war, tell us: “Never give up, there is always a way.”

We have learned that in this pandemic, if you work together as a team, you can make the impossible possible – like delivering die-casting machines to produce parts for ventilators or equipment to make the filters for the PCR tests for Covid-19. For many of our people this was an opportunity to shine – and shine they did.

**What did you learn about leadership?**

I learned that it is extremely important to maintain communication, to stay close to your team and stay close to your customers – even if there is nothing particular to discuss, just to be in touch, to feel the temperature and take it from there, day to day, and opportunity to opportunity. The most important thing as a leader is to be a source of positive energy.

**Which trends has the pandemic accelerated in your business?**

We saw an acceleration towards electro-mobility, but I don’t think this has any causal connection with the pandemic. All the big companies made announcements about building gigafactories for their own battery capacity.

We have also seen an acceleration in the trend towards exceptionally large die-casting machines. Before, we defined large die-casting machines as being somewhere in the 2,000-to-4,400-ton range. The large machines now are above 5,000 tons of locking force and we even go beyond 9,000 tons. These are used to build cars or to make antenna cases for 5G. One acceleration that was truly driven during the pandemic are all the trends in existing and new photonics applications. With all the virtual

meetings, everyone needs a camera, and the camera needs optics, and optics need coatings. Applications for the sensors you have in your phones or wearables were also on the rise. Our Leybold Optics business area has been remarkably busy and growing.

**Which changes caused by the pandemic are here to stay?**

I think we have learned when it’s worth traveling and when it’s not. I believe people will travel to meet people, and to be with people, and to enjoy time together. I don’t think people will travel to do PowerPoint presentations or discuss spreadsheets or for training, all of which you can do online.

We have learned how to work in the purely virtual world. I believe people will travel in a more considerate way and put the human element at the







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center when they do travel. It is a fantastic feeling when you go and see customers. And we are doing that already and looking forward to doing even more.

**What new opportunities are you seeing?**

All our Advanced Materials businesses are driven by growth trends. In wet grinding and dispersing technologies, it's driven by the demand for lithium-ion batteries. In the first half of 2021, we saw record orders. We also see new applications for grinding raw materials that go into these batteries. In die casting, the trend is towards very large parts and e-mobility parts. In Leybold Optics – our thin-film coating technologies – it's photonics applications such as the sensors that go into a phone. A typical phone today has not one, but multiple cameras and these are sold not in the millions, but in the billions.

**SAMUEL SCHÄR**

Chief Services & Sales Officer – Group,  
CEO Advanced Materials



**“TO PROBE WHAT IS POSSIBLE, SEE HOW FAR YOU CAN GO, SEE WHAT MAKES SENSE, EXPERIMENT, AND THEN, WITH ASSURANCE, TAKE THE NEXT STEP – THAT IS WHAT MAKES A SUCCESSFUL LEADER.”**

**SAMUEL SCHÄR**

Chief Services & Sales Officer – Group, CEO Advanced Materials

**One of the overarching trends in the global pandemic has been regionalization. How has Bühler prepared for this?**

It has long been our strategy to be in the region for the region with our global services and sales organization. The pandemic has driven that forward. Having people present locally was a key success factor in continuing to service our customers. Going forward, I think we will foster that because it gives us an advantage.

But we have also learned, in terms of our manufacturing footprint, which products to put where, and that it may not be a good idea to have components or products that can only be made in one place. You may want to have at least two. Although this may not be the most efficient method in a non-crisis setting, in a setting where borders open and close and there may be new tariffs, this is certainly a wise thing to do.

**How do you see customer interactions in the post-pandemic world?**

I think we will be able to serve our customers even better than before because we will be more efficient. It will be clear who needs to be present at a meeting in person and who can be there virtually. If you're there, you are fully engaged in contributing. If you are a specialist that is only needed for an hour, then you can do that in a virtual meeting.

I think this is an opportunity for Bühler and for our customers. It means they have access more often to our specialists. And this simplified access is worth a lot, because we know specialists often need to rethink after a meeting and come back with changes, so this frequency of contact with them is more important than the intensity of one singular interaction.

**What do you recommend to your customers to remain future-ready?**

For the die-casting customers it's very clear: have the winning applications. And there are winning applications for various locking force sizes. In the case of our battery customers, it's all about economies of scale and continuous production. We have the technologies to continuously produce battery electrodes at a very high quality with significantly lower energy consumption and superior process stability. Now is the time to invest in these new technologies. But over and above, I would consult widely. We have had many exchanges with our customers during the pandemic and have therefore reconfirmed that we can learn so much from each other, no matter what. You pick up something from another company and you mix it with your own activities and then you can give it to somebody else. It's this network that future-proofs us all. No one knows it all. We need to learn from each other.

**Is now the time to invest in something new?**

There have been very difficult moments in the pandemic. We need to stay positive in the face of big challenges, believe in our abilities, and take the action required to be ready when business comes back – that is exactly how you need to act, rather than closing everything down. It's easy to call off every meeting. It's easy to be only virtual. It's easy to be only in your office. But to probe what is possible, see how far you can go, see what makes sense, experiment, and then, with assurance, take the next step – that is what makes a successful leader. Continuously innovate, not just through R&D but also in your own mindset. That's what we did at Bühler. And that's exactly what I also recommend that our customers do.





# **GERMAR**

# **WACKER**

## ***CEO CONSUMER FOODS***

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**What's the most important lesson that you have learned through this pandemic?**

The pandemic has driven home how fragile the system is in which we live. It has also highlighted how, particularly in our generation and in the part of the world we live, we take too many things for granted. But we also learned that if we come together and collaborate, we can do amazing things. Look at how quickly we were able to develop vaccines. Whether it is collaboration across regions, in innovation ecosystems with academic partners, with suppliers, partners, or customers, I am convinced we will find strength in collaboration to be innovative and to find solutions to global challenges.

**Which trends has the pandemic accelerated in your business area?**

We had already observed rising health awareness in food as well as demand for local ingredients and local recipes. In many parts of the world, this trend has been strengthened because people have spent more time at home preparing food for themselves.

Mobility was obviously heavily impacted and that leads to changes in food patterns – people didn't grab something to eat on the way to work like a cereal bar, they worked at home and prepared a bowl of cereal for themselves. Airports were closed and the gifting section experienced a collapse in demand. But chocolate tablets saw a rise because that is something you eat at home.

With everybody a bit more cautious on spending, I was worried people might save in the area of sustainability efforts. But I'm delighted to see that the sustainability trend is unbroken and even strengthened through the crisis. Whether it is energy efficiency, CO<sub>2</sub> reduction, waste reduction or up-cycling, we see global players coming to us and asking for solutions, wanting to co-develop applications and change their operational system to a more sustainable one.

**How important is it, especially in times of crisis, to continuously invest in innovation?**

A lot of our customers immediately stopped development activities to protect liquidity. Let's not forget some of them are small family businesses. For them to be out of revenue for a couple of months can quickly become an existential threat. But after

a while, companies started asking how they could make an opportunity out of this crisis, and once the vaccinations were being delivered, that's when product development picked up again. They started to ask: How can we enrich our portfolio, how can we progress on sustainability, how can we come up with new recipes, or optimize our equipment? Our application centers are now fully booked. That's why I'm confident that, as consumers return to pre-pandemic consumption patterns, our customers will have the confidence to invest.

**Where do you see the biggest new opportunities for customers?**

They lie in the whole question of health, alternative ingredients, alternative recipe formulations, and new product ideas that can be generated out of that. They could be very regional products. We've seen a reawakening and an appreciation and maybe even a bit of regional pride in particular regional flavors. You also see it around alternative proteins and around sodium or fat – all these questions of health where you find a lot of start-ups playing. The question of affordable, healthy food is a big pull, for big players too. There's also a large field of opportunity in catering to the needs of markets with an increasing awareness of food quality and food safety, but limited funds to invest. That is something that will continue to gain importance.

**How is Bühler prepared for a more regional approach?**

We are pretty much globally present, with good links to different regions, their cultures, customs, and trends. This allows us to develop a thorough understanding of the needs of consumers and our customers in the industry. At the same time, we can support them with global technology and processing solutions know-how. Think global, act local. That is, for me, still fundamentally true.

**How do you see customer interaction in the post-pandemic world?**

We should learn to appreciate both the potential that digital communication allows us and the value that personal interaction provides. The benefit of virtual communication is you can interact with a customer faster. Look at Bühler Virtual World – who would have thought you can develop a platform where thousands of customers can engage with us in webinars and one-on-one sessions. It has also meant we could give remote support. We could link the customer with the experts and talk them through their problem and how to solve it. It's a lot faster and often more efficient than sending a technician. At the same time, I think we all appreciate the possibility of meeting personally. Over the last two months, I've had more and more possibilities to

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**GERMAR WACKER**  
CEO Consumer Foods



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**GERMAR WACKER**  
CEO Consumer Foods



welcome customers onto our premises again or to visit them. When you visit, you do it with more awareness that this is the time to build a personal relationship and the trust that is especially important in a B2B environment. So, hybrid interaction will be the way forward.

**Remaining future-ready in this climate is more important than ever. What do you recommend to your customers?**

Be courageous to innovate because only if you innovate can you discover new potential. We have seen how we cannot rely on the status quo, how environments can suddenly change, and how important innovation is in such a situation to open new opportunities. And we see that innovation cycles are a lot faster and that consumer preferences are diverse, which requires a higher degree of flexibility in the solutions. At the same time, I think it's also part of our global responsibility to ensure that our sustainability commitment is part of the ecosystems in which we operate.

**Have customers embraced digitalization?**

Digitalization allows us insights that were not possible before. This enables us to increase efficiency and the uptime of our equipment. It enables us to generate value by optimizing operations. A lot of players around the world are strong in software and electronics, but the combination of that with process understanding and know-how – that is where the true value lies. It's not just about gathering data. It's about how we translate data analytics into changes in process to create impact for our customers. This is on our daily agenda for all our customers, big and small.

***\_enkindle***

# **IGNITING INNOVATION**

TEXT: STUART SPEAR

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*The speed at which Covid-19 disrupted established business certainties took many companies by surprise. So, what has the last year taught us about the importance of innovation in a time of crisis?*



# *THROUGH CRISIS*

**DURING THE LAST** global financial crisis, the US-based entrepreneurial think tank the Kauffman Foundation published research revealing that 57 percent of the companies in the 2009 Fortune 500 had been launched during a recession. It surprised many and raises a pertinent question for today's Covid-affected businesses: What is it about a crisis that can prompt innovation?

A glance at the Harvard Business School web pages reveals no shortage of theories. For a start, a crisis generates a dramatic shift in employee engagement and a depth of organizational thinking as people are compelled to come together and unite around a single purpose. A crisis can also reveal previously ignored organizational weaknesses, which require innovative thinking to shore up what in the past were not considered to be serious problems.

A crisis will also challenge the old ways of doing things. Traditional business structures have often been designed to achieve efficiency and consistency. Something like the Covid-19 pandemic forces a reframing of purpose with the focus on new solutions rather than protecting the status quo. The need for solutions also means looking for good ideas outside traditional management structures.

Leonard A. Schlesinger is Baker Foundation Professor at Harvard Business School and has been researching crisis management and advising businesses through crises for over a generation. He sees Covid-19 as an important wakeup call for businesses who are going to increasingly need to learn how to quickly adapt to the unexpected.

"There is no question that the vast majority of companies I interact with were unprepared for the pandemic and, in my view, overreacted to the crisis, scaring the heck out of their employee base and customers," Schlesinger explains. "Covid-19 has taught us there is no new normal, just a next normal that businesses will have to learn to adapt to, and the profound question is what processes and standards will businesses now put in place to help them adapt to the next crisis."

### **How Covid-19 forced change**

Over the past year we have watched companies adapt their business models as we were all forced to make different consumer choices based on our altered circumstances. Home deliveries, evolving social media, streamed entertainment, and home exercise have all transformed different markets.

It is this level of market disruption that inspires the sort of start-ups that will join tomorrow's Fortune 500 list. But innovation does not just come from the start-up companies. In August 2020 Walmart announced it was setting up 160 drive-in cinemas in its American store car parks, Starbucks has announced it is moving to pick up rather than a

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NEW IDEAS."***

**LEONARD A. SCHLESINGER**

Baker Foundation Professor at Harvard Business School

café service, while Amazon is rolling out its Dash Cart so you no longer have to queue at checkouts. However, not all companies have been able to adapt. A study published last year by the management consultancy McKinsey & Co of 200 companies across different sectors revealed that while 90 percent of executives agreed Covid-19 would fundamentally change how they did business over the next five years, fewer than 30 percent of those same executives felt equipped to address these changes. The survey revealed how many businesses hit by a crisis turn to cutting costs, driving productivity and implementing safety measures rather than looking for wider solutions.

### **Creating space to innovate**

Schlesinger points out that the danger of going into this sort of survival mode when hit by a crisis is that it extends the pain as the horizon point where business uncertainty is likely to lift just keeps getting more distant. "The interesting issue for businesses going into a crisis is that they are dealing with a position of extreme uncertainty and there is nothing worse than treating uncertainty with certainty," Schlesinger explains. "A crisis is a marvelous opportunity for hypothesis generation, experimentation, and to engage workforces in having a voice in advancing new ideas through a rigorous program focusing on what we are trying to learn, how we are doing it, and how quickly we can come up with sensible outcomes."

In short, a crisis presents an opportunity for a business to rethink its way of working. So, what is the difference in approach between businesses that innovate themselves out of a crisis and those that flounder? Schlesinger points to the way decisions are taken as key. While hierarchical decision-making may work for a company when things are predictable, uncertainty requires a different





### LEONARD A. SCHLESINGER

**Leonard A. Schlesinger** is Baker Foundation Professor at Harvard Business School, where he serves as Chair of the School's practice-based faculty and Coordinator of the Required Curriculum Section Chairs. He has served as a member of the HBS faculty from 1978 to 1985, 1988 to 1998, and 2013 to the present. During his career at the School, he has taught courses in Organizational Behavior, Organization Design, Human Resources Management, General Management, Neighborhood Business, Entrepreneurial Management, Global Intelligence, Leadership and Service Management in MBA and Executive Education programs. He has also served as Head of the HBS Service Management Interest Group, Senior Associate Dean for External Relations, and Chair of the School's (1993–94) MBA program review and redesign process.



### PETER FISK

**Peter Fisk** is a bestselling author and Professor of Leadership, Strategy, and Innovation at IE Business School in Madrid, where he leads their flagship executive programs. His career was forged in a superconductivity lab, accelerated by managing supersonic travel brands, shaped in corporate development, evolved in a digital start-up, and formalized as CEO of the world's largest marketing network.

He leads GeniusWorks, a London-based future business accelerator working with executive teams to explore their futures. He is also Thinkers50 Global Director and founder of the European Business Forum.

He has 30 years of practical business experience, working with business leaders in over 300 companies and 55 countries, from Adidas to American Express, Bosch and BNP Paribas, Cartier to Coca-Cola, McKinsey and Microsoft, P&G to Pfizer, Virgin and Visa, and many more.

approach. In a crisis it's the idea that is important, not the person who has it. Employees need to be empowered to feel their ideas matter and to achieve that, the business needs to make the sharing of ideas a safe and comfortable thing to do.

"Google identified the precondition of psychological safety as the most important foundation of effective group work," Schlesinger explains. "More important than the IQ of your team is the ability to maximize the differences in your team through people feeling comfortable to speak up and share their ideas." But it is no good having a good idea unless it is properly implemented. Theories need to be tested, so businesses need to be able to undertake fast and effective data collection and then test the idea before it is acted on. "If you want innovation, this is the era of cheap and rapid experimentation," points out

Professor Schlesinger. "The only way to deal with unknowns is to take a guess, take a step, see what happens, generate the data, and then figure out what you do next."

Another key characteristic of a company able to innovate itself out of a crisis is effective communication. Covid-19 has demonstrated how much misinformation surrounds a crisis and a customer's grip on reality will be as good as the last news story they have read. Schlesinger believes that in a crisis a company has to take control of their own messaging and be communicating trusted information with a high degree of frequency. "You need to be active, you need to be present, and you need to be perceived as the source of honest broker information, as well as demonstrating that you are listening to the people who are asking questions," says Schlesinger.



When employees are given a voice, they become true innovation accelerators in crises.

In June 2021, Bühler hosted the One Young World Switzerland Caucus to address global issues.





***"I REJECT THE IDEA OF A NEW NORMAL BECAUSE IT IMPLIES A STEADY STATE. IN REALITY, THE FUTURE WILL BE A VERY DYNAMIC AND PROBABLY QUITE TURBULENT TIME WHERE WE WILL SEE RELENTLESS CHANGE WITH TECHNOLOGY BEING THE BIGGEST DRIVER."***

**PETER FISK**

Professor of Leadership, Strategy, and Innovation at IE Business School, Madrid

The Covid-19 pandemic has demonstrated how quickly a stable reality can be turned upside down. The current challenge for businesses is the number of potential unknowns that are in play when it comes to predicting the future economic landscape.

Top of the present list is disruption from climate change. Unpredictable climactic events are likely to produce even greater uncertainties than the current crisis and so will require companies to apply even greater resilience through the capacity to innovate. The World Economic Forum Global Risks report for 2020 surveyed 800 leaders from business, government and non-profit communities, asking them to list the top ten risks by likelihood and impact over the next 10 years. The top five listed are extreme weather, climate action failure, natural disasters, biodiversity loss, and human-made natural disasters.

Other global trends with the potential to disrupt markets are on the horizon. These include global population growth, higher life expectancy, the growing middle classes, increased urbanization, geopolitical instability, the rise in cyberattacks, and the possibility of another pandemic.

#### **Disruption on the horizon**

Peter Fisk is the author of numerous books on innovation in business and is Professor of Leadership, Strategy, and Innovation at IE Business School in Madrid. He agrees with Schlesinger that companies need to learn how to prepare for uncertainties. "I reject the idea of a new normal because it implies a steady state," Fisk explains. "Whereas in reality the future will be a very dynamic and probably quite turbulent time where we will see relentless change with technology being the biggest driver as AI and data enable ever-more dramatic changes in the supply chain and the way organizations work together."

As computer processing power, data storage, and interconnectivity have grown, so too have businesses been forced to adapt to new technology-driven markets. In many cases, Covid-19 has acted as an accelerant. Retail businesses have been particularly affected in that they have had to change their relationship with both their customers and their staff simultaneously. Companies traditionally reliant on retail properties have been forced to rethink their business models in months rather than years. Other fields of Covid-related innovation have been in education and healthcare delivery, both driven by the need to keep face-to-face contact to a minimum.

#### **Technology as disruptor**

Fisk points to a recent interview with the head of one of the world's largest refrigerator manufacturers for his most recent book "Business Recoded" to illustrate the potential of technology to disrupt. "He told me that by 2025 fridges will be given away for free by refrigerator manufacturers because the problem with fridges is that they are just inert objects that sit in your kitchen," explains Fisk. "But if your fridge is linked to the Internet of Things then you can track what goes in and out of the fridge and suddenly you can offer a retail service, then you deliver to people's homes and start offering nutritional advice or help on how to entertain better."

While still in its early days, another example of the power of technology to disrupt is the way some food businesses are marrying a customer's DNA profile with the food they eat. The Japanese future food start-up Open Meals has recently opened a Tokyo restaurant called Sushi Singularity, where customers provide a health kit when they book a table from which biometric and DNA data is gathered to produce a 3D-printed sushi to perfectly match a diner's nutritional needs.

The ability to innovate is no longer just a commercial requirement to stay competitive but has become an essential survival tool for businesses as times get increasingly changeable. This last year of disruption has demonstrated the advantages that can be gained by companies that are prepared to innovate through crisis.

"We have seen companies in situations born out of desperation make 10 years of advancement in e-commerce in the first three months of the pandemic," explains Professor Schlesinger. "I've got countless numbers of examples of businesses that have been forced into experimentation over the past year that are now coming out of this period of forced experimentation with a portfolio of new business models."



*generate*

# **SUPERCAR BATTERY PRODUCTION**

TEXT: LUKAS HOFSTETTER



# CHARGING

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*Life as we know it is inextricably linked with batteries. From smartphones and electric cars to grid stabilization for renewable energy power plants – batteries are at the heart of how we communicate, entertain ourselves, and drive a more sustainable future.*



**WITH SO MANY STAKEHOLDERS** looking for more efficient batteries and the ability to produce on an industrial scale, the industry is experiencing change and innovation at an unprecedented rate. In 2020, 1.38 billion smartphones were sold worldwide. General Motors' announcement in January 2021 that they would go "all-out electric" by 2035 is perfectly in line with the trend seen among car manufacturers worldwide as they accelerate their push for green mobility. To support grid stabilization, battery parks are being built all over the world with capacities of up to 1 Gigawatt – that equals the power produced by 3.125 million solar panels. These are impressive figures that have one thing in common: an insatiable appetite for batteries. Bühler's continuous mixing technology for battery slurry plays a key role.

"It's an exciting time to be in the battery business. The market is so dynamic, there are new players and innovations popping up everywhere, and it shows no signs of slowing down," says Adrian Spillmann, Director Market Segment Battery Solutions at Bühler. "Electro-mobility is really picking up speed – increased customer demand, tighter government regulations to reduce the carbon footprint, technological improvements, and the rapidly growing infrastructure are converging to form a perfect storm."

It's this kind of demand anticipated by Bühler's Grinding and Dispersing business area – one of Bühler's three business areas in the company's Advanced Materials business, with a turnover of nearly CHF 100 million – when it set up its Battery Solutions business around 10 years ago. Based on its proven twin-screw extruder technology for the food and feed industry, Bühler invented a new continuous mixing process for battery slurry. Instead of using cereals and pet food, the engineers started running trials with electrode slurries. "We said to ourselves: 'Let's go for it.' We have the technology, and we have the process know-how to improve battery slurry production in terms of speed, flexibility, quality, and quantity," says Spillmann.

#### **A quantum leap**

The quality of the electrode slurry is essential for the performance and energy density of a lithium-ion battery. Traditionally, slurries are produced in large vessels which do not necessarily meet the requirements for large-scale production in terms of total cost of ownership. The process is also very inflexible. If a batch does not meet the requirements, it is either disposed of, reworked, or used for inferior products. While the production of large batches takes several hours, the continuous mixing process requires only a few minutes. "We use a rotating twin-shaft mixer to combine the necessary process

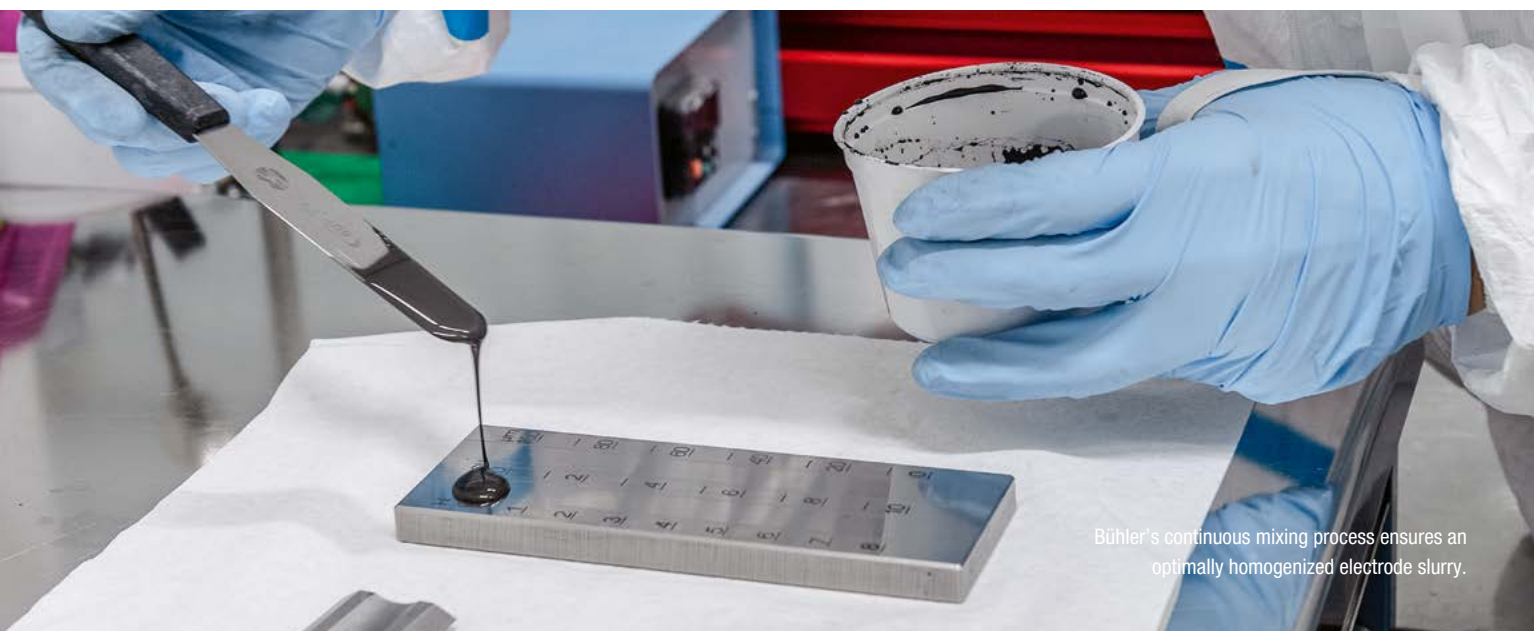
**"THE CHALLENGES ARE HUGE,  
BUT SO ARE THE OPPORTUNITIES.  
AT THE END OF THE DAY, IT'S ALL  
ABOUT LIVING UP TO OUR  
PROMISE OF 'INNOVATIONS FOR  
A BETTER WORLD'."**

**ADRIAN SPILLMANN**

Director Market Segment Battery Solutions at Bühler







Bühler's continuous mixing process ensures an optimally homogenized electrode slurry.

steps such as pre-mixing, homogenizing, dispersing, and degassing into a single, continuously running unit," says Spillmann.

Thanks to this continuous mixing process, the manufacturer can intervene at any given moment should the results not meet the requirements. What counts is that the improved mixing process significantly increases battery performance. It also reduces investment costs, and the energy costs are much lower, too. Lastly, the new process takes up much less space, and fewer rejects are produced. This process took years to develop.

In 2017, the opening of the first production plant at Lishen in Suzhou/China marked a milestone in the industrial-scale production of battery slurry. Yi Liu works as an engineer for the Chinese battery manufacturer Lishen. He developed the technology with the Bühler team and said during the inauguration ceremony: "This solution will completely change the battery industry. It is a historic moment, a revolution."

### **Consistent quality is key**

Four years later and 9,000 kilometers away, Valentin Dolder and Adrian Spillmann look at the latest data from Bühler's Inline Quality Control expert system, QuaLiB. It enables inline monitoring and controlling of process parameters. "Continuous quality control is pivotal in the production of battery slurry. Before we introduced QuaLiB, manufacturers would lose time and money by physically taking samples, running offline measurements in a lab, and noticing quality issues too late. By using the QuaLiB system, the production yield can be increased," says Dolder.

After successful trials in China and Switzerland, Dolder and his team are now running tests with a major carmaker in Germany. For Dolder, every battery producer that uses Bühler's continuous mixing process should include QuaLiB in their process. "The system is fully integrated in the process, and automatically identifies the product quality in real time."

Moreover, producers enjoy complete transparency of their process and materials, which becomes more and more important as entire value chains are having to function like clockwork amid rapidly increasing demand.

### **Insatiable global demand**

Asia's leading role in the industrial production of batteries started in 1991 when Japanese Sony and Asahi Kasei released the first commercial lithium-ion battery. With electric cars taking over the roads and the increasing demand for battery parks, Europe is confronted with an infrastructure gap in relation to Asia when it comes to large-scale battery production. The European Battery Alliance (EBA) aims to close this gap to reduce Europe's dependency on batteries from Asia, and has the backing of the European Union's members.

In January 2021, the European Commission approved a EUR 2.9 billion public support package from twelve Member States for a second Important Project of Common European Interest (IPCEI) to support research and innovation along the entire battery value chain. From raw and advanced materials to battery cells, battery systems, and recycling and sustainability, Europe aims to make up some of the ground lost over the last decades.

It is also proof of the strategic importance of batteries. A 2019 study by the World Economic Forum (WEF), the Global Battery Alliance (GBA), and McKinsey analysis projects that global battery demand will grow by a factor of 14 between 2018 and 2030 – from 184 Gigawatt hours (GWh) to 2,623 GWh. The bulk of global demand will come from electric mobility at 2,333 GWh, while energy storage and consumer electronics will require 221 GWh and 69 GWh respectively.

### Strategic importance

A look at the supply and demand by region reveals why the European Union is investing heavily in building up its own production infrastructure. In 2030, almost 43 percent of demand will come from China at 1,122 GWh, and Europe's appetite for battery power will amount to roughly 17 percent at 443 GWh.

The study's authors expect global cell production capacity to reach 860 GWh by 2025, of which 60 percent will be from China. This leaves a gap of 1,700 GWh to meet the anticipated demand in 2030 and could result in supply shortages for European

car manufacturers. These projections underline the global urgency of ramping up production capacities and avoiding dependencies on all sides.

Spillmann experiences the gear shift in the car industry on a daily basis. "All major car producers are betting on electric vehicles. The internal combustion engine has been at the heart of their production lines for decades, and now they're all rushing to build up capacities to make their own batteries."

The announcement by German car manufacturer Opel on July 8, 2021 underlines the speed with which change is happening. The company said it would stop producing cars with internal combustion engines in Europe by 2028, setting one of the most ambitious targets in the industry.

### Science at the heart of innovation

In his lab in Dübendorf in Switzerland, Corsin Battaglia analyzes new battery materials with his colleague. He is the Head of the Laboratory Materials for Energy Conversion at the Swiss Federal Laboratories for Materials Science and Technology (Empa), and in his role, he knows just how fast the heart of the battery industry is beating these days. "It's a very dynamic industry, and the speed with which electric mobility is gaining momentum drives innovation at an unprecedented level," he says.

Battaglia and his team conduct research projects and collaborate with industry. "We are developing new materials and processes for next-generation batteries by looking not only at fundamental materials science issues, but also at how new materials and processes can be transferred to industry."

So, what exactly are Battaglia and his team focusing their research on? "From a material perspective, lithium metal is a very interesting anode material for next-generation batteries. Compared to today's lithium-ion batteries with graphite anodes, batteries



***"THE SYSTEM IS FULLY  
INTEGRATED INTO THE PROCESS,  
AND AUTOMATICALLY IDENTIFIES  
THE PRODUCT QUALITY  
IN REAL TIME."***

**VALENTIN DOLDER**

Technologist Market Segment Battery Solutions at Bühler





Corsin Battaglia and postdoctoral researcher, Marie-Claude Bay in the laboratory of the Swiss Federal Laboratories for Materials Testing and Research (Empa).

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**CORSIN BATTAGLIA**

Head of the Laboratory Materials for Energy Conversion at Empa

with lithium-metal anodes can store almost twice the amount of energy per charge,” he says. This would extend the reach of electric vehicles and improve the storage capacity of battery parks. “One major issue for lithium-metal anodes is the tendency to form so-called lithium-metal dendrites, which can provoke a short circuit in the battery. That is where material science comes into play. New solid electrolyte materials are promising to prevent dendrite formation and enable next-generation solid-state batteries.”

Another element keeping researchers around the world on their toes is cobalt. Sixty percent of cobalt is found in the Democratic Republic of Congo (DRC), and the extraction methods have a significant impact on society and the environment. There are alternatives, but their energy density remains a challenge. “Lithium iron phosphate (LFP) for example is cobalt free, but its energy density is lower,” says Battaglia. “We are developing cathode materials based on manganese and titanium, which result in high energy density, but still suffer from relatively low stability when cycled in a battery.”

Empa is also investigating higher-level topics such as a circular economy for batteries. “While manufacturers need to produce millions of batteries as soon as possible, we’re taking a more holistic view and ask ourselves how we can expand the life cycle of batteries and contribute to sustainability,” Battaglia explains. “For example, we are collaborating with the Swiss company Kyburz to develop a novel energy-efficient aqueous recycling route for lithium-ion battery cell assembly.”

At the Battery Application Lab, Spillmann looks to the future with optimism. “Batteries will be at the heart of the green transformation in the mobility and energy industry. Thanks to increased investments and a real sense of urgency, innovation and collaboration is happening on a scale we’ve never experienced before. With our continuous mixing technology, we have a proven and sustainable solution for our customers that will allow them to ramp up production capacities and ready themselves for the increasing demand.”

Bühler is not resting on its laurels, but powering entire industries is a task too big for anyone to solve alone. With the help of its vast network of industrial partners, scientific institutions, and thanks to its drive for innovation, Bühler’s Grinding and Dispersing team is taking up its responsibility in this quest. Spillmann concludes: “We will continue to innovate together. The challenges are huge, but so are the opportunities – we’re proud to do our part. At the end of the day, it’s all about living up to our promise of ‘innovations for a better world.’”

*\_alliance*

# HOW TWO PARTNERS SET **MILE**

*Premier Tech and Bühler are on the fast track. Since announcing their strategic partnership in bulk packaging in 2019, they followed up less than a year later with the creation of their joint venture based in China. This venture represents added value for customers who rely on cost-effective automated packaging technologies. Since March this year, many have benefited from the first jointly marketed, fully-automated solution.*

**IN GRAIN PROCESSING,** packaging is the last step before transporting flour to bakeries and other food processors, rice to distributors or pellets to farms. In many cases – especially in developing countries – the bagging operation is still done manually. This is not only inefficient, costly, and slow, but also implies a certain variation of weight and therefore a higher give away of the packaged goods. Premier Tech and Bühler saw a gap in the market that they could fill for their customers. “We see immense potential. The portfolio and expertise of Premier Tech and Bühler will enable future packaging solutions which are significantly more efficient, accurate, and food safe by using automation technologies,” explains Johannes Wick, CEO Grains & Food at Bühler.

With Bühler’s strong footprint and market position in China and Premier Tech’s highly-recognized knowledge in the field of automated packaging technologies, customers can rely on solutions from a







# STONE

# AFTER

# MILESTONE

TEXT: MARKUS REBER



Johannes Wick and André Noreau shake hands on their partnership back in 2019.

#### VIDEO



Discover the partnership between Premier Tech and Bühler.

**“WE ARE COMMITTED TO  
WORKING TOGETHER TO MAKE  
FOR THE BEST CUSTOMER  
EXPERIENCES WHILE FULLY  
ADDRESSING THEIR NEEDS.”**

**ANDRÉ NOREAU**

CEO of Premier Tech's Systems and Automation business

single source and from intake to palletizing, reaping all the advantages offered by the partners. “What is magical about this partnership for our customers is to benefit from Premier Tech’s technological knowledge, Bühler’s operational knowledge, and unparalleled customer support from two organizations with a global footprint,” says André Noreau, CEO of Premier Tech’s Systems and Automation business. The partners have proven to be quick in their ability to implement their joint plans. At the end of August 2019, the two announced their strategic cooperation, which resulted in the establishment of the joint venture at Bühler’s production site in Wuxi, China in July 2020.

The next milestone quickly followed in March this year when Premier Tech and Bühler launched the CHRONOS OML-1060 – their first joint solution for these needs and the first of what is sure to be many cost-effective industrial packaging solutions to come. “It is amazing to see what we can achieve

when two industry leaders join forces. Only eight months after officially starting our joint venture we have introduced to our customers the most competitive fully automated packaging solution for granular products,” says Johannes Wick.

Customers from their industries responded with great interest to the more cost-effective bagging technology, which is based on an existing Premier Tech solution. With design and technology already used in their existing solutions produced in Europe, the new fully automatic packaging solution for the grain, food, and feed industries is a more affordable iteration of an existing high-end solution.

The partners have incorporated features their customers have most requested, therefore meeting the requirements of emerging markets without making compromises on accuracy or reliability. As the first open-mouth bagger from the Premier Tech-Bühler alliance, the OML-1060 can easily handle free-flowing granular material such as animal feed,



pet food, rice, seeds, and plastic pellets. It can handle 20 to 50 kg bags at a speed of up to 600 bags per hour. Designed to be highly efficient, it can run any type of bag, including non-laminated polywoven that can be problematic to fill due to their irregular properties. It is also compatible with most common bag closing systems. OML-1060 has a small and compact footprint that optimizes floorspace and its lean design eases operation and maintenance. Safety being a priority for both Bühler and Premier Tech, it requires very limited operator interaction, enabling better working conditions.

### World-class partnership

A little more than a year ago, the Premier Tech-Bühler alliance set up their 50/50 joint venture to cover the needs of food and feed customers both in China and other markets requesting cost-effective automation. “Customers will benefit from significantly more efficient, and even more accurate and food safe packaging solutions thanks to automation technologies developed by Premier Tech and Bühler,” says Johannes Wick.

Manufactured in Premier Tech and Bühler’s joint technology and manufacturing center in Wuxi, China, the solutions are produced to the same standards the partners have set for their solutions in North America, Europe, and elsewhere. Both Bühler and Premier Tech will offer the joint venture’s solutions in their markets, with Bühler focusing on turnkey plants, and Premier Tech on standalone solutions. “The global partnership will serve customers worldwide by building on Premier Tech’s recognized knowledge in the field of automated packaging technologies while making full use of Bühler’s strong international services and sales network,” says André Noreau.

Combining over 200 years of industry knowledge, Premier Tech and Bühler’s packaging solutions bring new opportunities to the markets in China, Southeast Asia, Africa, and South America, ensuring exact, safer, and more reliable packaging equipment. “Our customers will now have access to the best technologies from Premier Tech and Bühler at competitive prices and a service network that can quickly take care of their needs,” says Alexis Michaud, Technical and Product Director, Premier Tech – Bühler.

Having attracted talents from both companies, the joint venture benefits from Premier Tech’s superior packaging expertise and technological leadership in this field, while Bühler contributes its knowledge of high-quality manufacturing and supply chain management in China as well as its digital solutions. In terms of digitalization, the teams are working on integrating packaging solutions into Bühler plants as this is one of the final steps to be able to show customers transparency and traceability of the products from the intake to the pallet. The partners agreed that BühlerInsights is a key enabler to drive connectivity. “We are committed to working together to make for the best customer experiences while fully addressing their needs and complementing each other in all cases,” says André Noreau.

The next milestone from the partnership is already in the making. Currently, the partners are working on their first open-mouth bagger, which will pack powder as well as flour at high speed and high accuracy. It is set to be completed this year, with production starting in 2022.

### VIDEO



CHRONOS OML-1060 – the fully automated bagger for granular products.

**“OUR CUSTOMERS WILL NOW HAVE ACCESS TO THE BEST TECHNOLOGIES FROM PREMIER TECH AND BÜHLER AT COMPETITIVE PRICES AND A SERVICE NETWORK THAT CAN QUICKLY TAKE CARE OF THEIR NEEDS.”**

### ALEXIS MICHAUD

Technical and Product Director, Premier Tech – Bühler

# AN EL

*\_collaboration*

# DORADO FOR

# FOOD

TEXT: LUKAS HOFSTETTER

# INNOVAT

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*Plant-based proteins show no sign of slowing down in their quest to conquer food markets across the globe. Southeast Asia is no exception, and Singapore is leading the way as a fast-paced, international hub for innovation and collaboration in the food industry. With their recently opened Protein Innovation Centre, Givaudan and Bühler are perfectly suited and situated to test and scale plant-based food innovations in close collaboration with start-ups, established food producers, and university researchers.*





# ORS





**THE GLOBAL MEAT** market is experiencing fundamental changes. While the growing middle class in emerging markets will continue to drive demand for conventional meat, its worldwide share will drop to 72 percent by 2030 amid rising demand for meat alternatives, according to the management consulting firm A.T. Kearney. Plant-based products are expected to boost to a market share of around 18 percent in 2030. The main reasons for this substantial change in consumer behavior are health and environmental concerns, and alternatives are becoming tastier and more sustainable as more players enter the fast-growing market. While these developments are a prime example of how consumer demand drives supply, a look at Singapore offers insights into how governments can contribute to the acceleration of food trends.

Singapore has set itself ambitious targets with its 30 by 30 initiative. The city-state aims to produce 30 percent of its food in 2030 – from farm to fork. Currently, Singapore imports 90 percent of its food according to the Singapore Food Agency (SFA), which is not surprising given its small area of only 728 square kilometers and lack of arable land. “If

the Covid-19 pandemic has taught us anything about global supply chains, it’s that they can be disrupted in a heartbeat. The Singaporean government has long realized that and wants to protect its citizens against shortages caused by declines in yield due to climate change,” says Adrien Beauvisage, Head of Region Southeast Asia & Oceania at Bühler. “This initiative combined with Southeast Asia’s openness to new products is the perfect breeding ground for Singapore as the hotbed for food innovation.”

### **Serving a bigger purpose**

But where does this openness come from? On one hand, traditional Southeast Asian ingredients such as tofu or tempeh are obviously not as exotic to local consumers as they might be for European or North American consumers. On the other hand, Singapore in particular has a rich history as a hub for international trade, including spices and other goods.

“Whenever new food trends would arise and global trade would pick up, Singaporeans were sure to get a taste of it,” Beauvisage explains. Today, Singapore is changing the game. With its 30 by 30 initiative, the government not only aims to increase



***“THE SINGAPOREAN GOVERNMENT HAS LONG REALIZED THAT GLOBAL SUPPLY CHAINS CAN BE INTERRUPTED IN A HEARTBEAT AND WANTS TO PROTECT ITS CITIZENS AGAINST SHORTAGES CAUSED BY DECLINES IN YIELD DUE TO CLIMATE CHANGE.”***

**ADRIEN BEAUVISAGE**

Head of Region Southeast Asia & Oceania at Bühler

the city-state’s food security but also to establish Singapore as the center for global food innovation. That’s just one of many reasons Givaudan, the global leader in taste and wellbeing, and Bühler opened their Protein Innovation Centre (PIC) at Givaudan’s Woodlands site in Singapore in April 2021.

The aim is clear and perfectly in tune with the SFA’s targets. “Through the Protein Innovation Centre, we aim to create an ecosystem that supports start-ups and food businesses in an environment of co-creation. The Centre will provide them with access to the expertise, networks, and technology needed to create authentic plant-based protein alternatives that meet consumer needs and expectations,” said Monila Kothari, APAC (Asia Pacific) President, Givaudan Taste & Wellbeing, in the wake of the opening ceremony.

The fact that Alvin Tan, Singapore’s Minister of State for Trade & Industry (MTI) and Culture, Community and Youth (MCCY) attended the event highlights the importance of the PIC in Singapore. To Ian Roberts, Chief Technology Officer at Bühler, the PIC is a symbol of the importance of collaborative innovation to tackle some of the most urgent

issues we’re facing. “Sustainably feeding a projected population of 10 billion people by 2050 is a challenge that cannot be solved alone. We are highly aware of the need to collaborate if we are to limit climate change to 1.5°C by 2030, while providing nutrition to our growing population. In the Protein Innovation Centre we combine with a like-minded partner to develop regionally relevant, great-tasting products on scalable industrial technology, providing a boost to the sustainable protein industry in Asia, home to half of the world’s population.”

#### **Adding speed and agility to the mix**

Satya Dwi Putra is an Extrusion Technologist at Bühler and has been at the PIC almost every day since Bühler began setting up its processing technology at Givaudan’s Woodlands site. He is responsible for customer trials at the PIC and experiences the many benefits it offers on a daily basis. “Before we had the PIC, Bühler would fly customers to our nutrition application lab in Uzwil, Switzerland, where they could test recipes that they already had in mind on a large scale of up to 500 kilograms per hour. Here at the PIC, we can try different raw materials and flavors together with customers and Givaudan on a much smaller scale, like establishing a proof of concept, and making sure the recipe is scalable,” he explains.

This adds agility and flexibility to the creation of new varieties, something that whets the appetite of both start-ups and big players in the food industry. “We’re currently running trials with SG Proteins, a Singapore-based contract manufacturing platform

for meat analogs. The PIC is fully booked until the end of August for trials, which is perfect for us to learn from each other and adjust our workflows. After that, we're starting trials with a multinational trading company of pulses, flour, and other grains whose goal it is to start creating their products using our technology for wet extrusion," says Dwi Putra.

### Catering to local tastes

The variety of plant-based meat alternatives in Asia is already astonishing – from prawns to chicken and beef to name but a few. "Demand for locally sourced foods is increasing, and with that comes an appetite for plant-based products that mimic traditional Asian meat recipes such as Thai Pad Krapow, Vietnamese Banh Mi, or Hainanese 'Chicken' Rice. The only limiting factor is a lack of imagination when it comes to bringing new products to the mar-

ket. To me, that's the stark contrast to previous food trends such as fast food, which originated in the US and swept across the globe with the exact same recipes in every country as their secret for success," explains Beauvisage.

This localism is a key driver for innovation in the plant-based meat industry, and the trend has certainly accelerated due to the coronavirus pandemic. "Here in Southeast Asia, we see new products on the shelves every week. That's the level and speed of disruption happening right now that brings both newcomers and established businesses to the Protein Innovation Centre," says Beauvisage.

Just about any recipe can be tested at the PIC. "Together with Givaudan, we agreed that every month, each of us will run the Centre for two weeks. But since we both contribute with our know-how in trials, usually everyone is involved," explains Dwi Putra. "The most challenging but exciting part is when new flavors are added and the consistency of the raw materials changes. That's when our processing expertise comes into play to find the right mixture, temperature, and pressure to create new products."

### All the right ingredients

Now that the Protein Innovation Centre is running at full steam despite restrictions due to the coronavirus pandemic, the question is what's next for this epicenter of food innovation. "The real beauty about working in the food business is that change and



***"EVERY DAY I LEARN SOMETHING NEW FROM OUR COLLEAGUES AT GIVAUDAN, AND I GET THE UNIQUE OPPORTUNITY TO SEE THE FOOD INDUSTRY THROUGH THE LENS OF DRIVEN AND INNOVATIVE PARTNERS."***

**SATYA DWI PUTRA**

Extrusion Technologist at Bühler







At the heart of the Protein Innovation Centre is Bühler's twin-screw extruder.

innovation are ever-present,” says Dwi Putra as he prepares the extruder for an upcoming trial. “We’re in talks with Singapore Polytechnic to create modules on extrusion for their planned courses on plant-based proteins. The PIC will be the part of their studies where researchers and students can apply their knowledge and carry out scientific research.”

Dwi Putra is excited about the future and looks forward to welcoming like-minded food enthusiasts to create healthy, tasty, and sustainable plant-based foods. “Every day I learn something new from our colleagues at Givaudan, and I get the unique opportunity to see the food industry through the lens of driven and innovative partners. This not only helps me grow both personally and professionally, but I can also bring these insights into Bühler and help develop our process solutions and service offerings further. This open exchange to achieve a common goal is the essence of the Protein Innovation Centre, and I couldn’t be happier to be part of it,” he says, smiling. With its people at the core, its network of partners and its perfect location, the Protein Innovation Centre has all the right ingredients to become the hub for food innovation beyond Singapore and Southeast Asia.

## INFO

**The Protein Innovation Centre** in Singapore is a state-of-the-art food application lab run by Givaudan and Bühler. The 400 square-meter production facility offers the latest technology for start-ups, universities, or established food producers to run complete trials. At the heart of the PIC is Bühler’s twin-screw extruder with a throughput of around 30 kilograms per hour, depending on raw materials. With this pilot-plant capacity extruder and cooling-die, both wet and dry products can be tested and potentially replicated on larger industrial lines. The facility is supported by experts from both Givaudan and Bühler, who will provide support to accelerate your product development.



Learn more about the PIC or send an e-mail to [pic.singapore@buhlergroup.com](mailto:pic.singapore@buhlergroup.com) to get in touch.



# Time to transform





**\_accelerate**

# INTERVIEW

INTERVIEW: IAN ROBERTS, BÜHLER CTO  
PHOTOS: JEKATERINA GLUZMAN

# WITH

# **PETER BAKKER**

*Our planet is facing unprecedented challenges, but it's in our hands to support the change needed to realize a world in which more than 9 billion people can live well and within planetary boundaries by 2050. This is Bühler's view and that of Peter Bakker, President and CEO of the World Business Council for Sustainable Development and a globally renowned leader and influencer for sustainability. In this interview, he explains why now is the time to transform.*

**Peter, it's great to have you with us in our studio in the CUBIC. Before becoming President and CEO of World Business Council for Sustainable Development (WBCSD) you had a highly distinguished career, first as CFO, and then as CEO of TNT NV. Why did you switch from this career in a major corporation to running WBCSD?**

In the latter years of my tenure as CEO, we built up TNT as one of the leaders in sustainability, and we got attacked by hedge funds from Wall Street on purely speculative grounds to make some short-term profits. There, I really learned that you could push a company as far as you like in sustainability, but if the capital markets don't get it, then we are not going to go fast enough, or far enough. After 10 years as CEO, and having turned 50, I decided it was time to get serious about changing the system. The WBCSD opportunity lured me in.

**So, this desire to drive impact came before you made the change, and your experience as a CEO has helped you, I suspect, in dealing with CEOs and multinational companies in a credible way?**

What I learned in my own term as CEO is that companies are probably the best, most actionable platforms in terms of institutions that the world has to bring about change. We have the power to innovate, as you at Bühler well know. We have the financing capacity. We have management talents to make change stick in the world. What we are missing is that the world around us – the system around us – is not always incentivizing radical transformation. That's what intrigued me about WBCSD. I have some recognition of what the challenges of a management team are, so I can relate to the difficulties in making these transformations stick. But at the same time, by bringing many companies together, I hope we can create a collective voice, a collective push to actually change the system and to change capitalism, to really incentivize the speed of transformation.

**This alludes to the mission and the approach of WBCSD. For our readers who are not aware of its core mission, can you explain the background?**

WBCSD was formed after the Rio de Janeiro Earth Summit in 1992. At that time, the world thought that business was the cause of all bad things, which of course, is not true. For the first 15 or so years, there was a lot of work to create awareness of what sustainability is within businesses. How can business contribute to more sustainable development? When I joined WBCSD about 10 years ago, I said we don't need to write anymore that sustain-

ability is important. We need to now bring companies together to really work on collective action, collective value change solutions, and form a collective voice to policy-makers. It was a collective push towards capital market players to make these changes happen.

We are a group of more than 200 mostly multinational companies, including Bühler, from different sectors and different regions that are driving the system transformation that is now needed. We work in the food system, the automotive system, and the energy system and ask: What does the climate challenge mean? What does the nature challenge mean? What does the equity challenge mean? What are the solutions that businesses can innovate into in order to then drive the world to a sustainable place?

***“BRINGING MANY COMPANIES TOGETHER, I HOPE WE CAN CREATE A COLLECTIVE VOICE, A COLLECTIVE PUSH TO ACTUALLY CHANGE THE SYSTEM AND TO CHANGE CAPITALISM, TO REALLY INCENTIVIZE THE SPEED OF TRANSFORMATION.”***

**PETER BAKKER**

President and CEO of the World Business Council for Sustainable Development

**You've just built a roadmap of how we should do this – your Vision 2050, and you've titled it “Time to Transform”. Can you give us some insights into that and the degree of urgency of taking action?**

Vision 2050 is perhaps a misleading name. Certainly, we needed to create the vision for 9-plus billion people to live well and within planetary boundaries. But what we are trying to do is translate that long-term vision into what every business should consider doing in the period between now and 2030.

We believe that there are three global emergencies: the climate emergency, the loss of biodiversity, and mounting inequality. If left unaddressed, business will either lose its license to operate, or the safe operating space for humanity is at risk. Moving from these emergencies to a vision of 9-plus billion people living well, we now need to radically transform the systems in which we operate. In Vision 2050 we ask: What are the major product and ser-





Peter Bakker met with Bühler's Board of Directors and Executive Board in June to discuss WBCSD's Vision 2050.

vices categories that business provides to society? We have identified nine, ranging from energy to mobility, to food. For each of those categories or pathways, we asked: What are the key transitions that the system needs to undergo and what are the 10 action areas that each business in that category should reflect on and integrate into their core strategy?

The fact is, we are now at the point that sustainability is no longer about Corporate Social Responsibility (CSR) or about philanthropy. I mean, if you do CSR and philanthropy, by all means, continue. That's not going to harm anyone. Hopefully, it does some real good. But we're now at the point where we need to integrate sustainability into core strategies and in the way we present ourselves to shareholders and financiers, and in the way we argue for policy change. It's become, in my mind, the main innovation opportunity for business.

**Would you give us some examples of companies that are doing something well in each of those spaces?**

If I think about climate action, there are lots of companies now setting bold ambitions to be net zero by 2050. And you see a race to the top. Companies are moving to 2040, and even 2030. Too much of it is

## INFO

### PETER BAKKER

**Peter Bakker** has led the World Business Council for Sustainable Development (WBCSD) since 2012. WBCSD is a global, CEO-led organization of over 200 leading businesses working together to accelerate the transition to a sustainable world. WBCSD member companies come from all business sectors and all major economies, representing a combined revenue of more than USD 8.5 trillion and with 19 million employees.

He is a distinguished business leader who, until June 2011, served as CFO and then CEO of TNT NV, the global transport and logistics company. He has been a recipient of the Clinton Global Citizen Award (2009) and the Sustainability Leadership Award (2010). He serves as a member of several corporate sustainability advisory boards.

Peter Bakker received the royal order Officer of the Order of Orange-Nassau in 2018, in recognition of his long-lasting commitment to engaging business in tackling global sustainability issues.



Peter Bakker and Ian Roberts on the sundeck of Bühler's CUBIC innovation campus.

approached as incremental change. How do we do what we do today but then with each year, with a little bit less CO<sub>2</sub>? What you see leaders doing now is really thinking through radical transformation.

Probably the automotive sector is among those industries where the strengths are now accelerating the fastest. We all know that continuing to drive in individual cars with combustion engines is contributing to climate change. The solution will be to achieve a fully decarbonized mobility system. Right or wrong, at the moment the world is betting on electric vehicles. So the electrification of the fleet is critical. While two or three years ago, they were still a bit cautious, companies are now committing.

#### **What sort of commitments are you seeing?**

Audi recently said after 2025, no more combustion engines. Other companies are setting targets for the early 2030s to be completely decarbonized. That is a radical transformation, because if you know the automotive sector, it's just one and a half cycles away in their product innovation. The industry is really changing now to be ready by 2030.

What you see there, however, is that the car companies can decide to build only electric vehicles, but if the electricity grid cannot provide enough renewable energy or the charging infrastructure, and other infrastructure is not available to charge all these vehicles, it's not going to work. And that's why in this Vision 2050, we said we need system trans-

formation. We need to bring all actors, different parts of the value chain, but also governments, and consumers into this space to make that change stick.

#### **What's another area that has experienced a big push?**

Biodiversity loss. The biggest push that we've seen emerge is in the area of regenerative agriculture. How can we move away from monocultures? How can we think differently about fertilizers and pesticides? How can we, by using multi-crops in the system, sequester carbon, improve the quality of the soil with diversity and actually increase the yield for farmers as a result of it, by which in turn they get a better life, better income streams, and eventually link that to the other side of the value chain?

The food we produce today is not necessarily leading to healthy diets. How can we use that regenerative agriculture to produce a healthier diet for consumers? Again, you can do things on the farm, but if it's not linked to the system and the health aspects of the system, then it's not going to be the solution that we need.

#### **In your report, you've stated that the Covid-19 pandemic has further increased the inequalities between northern and southern hemispheres and within developed nations.**

On inequality, I have to be honest, that's where companies have the fewest answers. I praise Bühler for all your activities, and the things you are doing with your Generation B initiative are amazing, but the



core inequality questions are yet to be addressed, and that is the case for most companies. I argue that inequalities are probably five years behind climate change. We still need to assess what inequality actually is, what the role of business is in addressing that topic, and what the solutions that we need to collectively build are. Do you know what you pay today in your supply chain? Most do not, and are not in a position to make that promise because they don't know their baseline. That's where the S in ESG (Environmental, Social, and Governance) reporting comes in – the social component and impact of your business. We need to do more work to measure what we do today to be able to improve and manage forward a world that is good for all.

**All of these things, if we bring them together, are going to also force a change in the way that we look at the economics and how we value business. This was one of your ambitions – to fundamentally change our capitalistic model or to move completely to a new one. But how are you going to manage that and what role can WBCSD play in that?**

I think the challenge at hand is not to dream up a new system that is better than capitalism. I'm sure bright minds are working on it, but that's not what WBCSD is about. As part of Vision 2050, we ask; how do we reinvent capitalism? It's a good economic system, but it's too limited in its focus. We measure the success of a country in GDP, and of a company in cash-flow or profit. But that only looks at the financial performance of a business. We know that business uses natural capital, the impact on the environment. It uses social and human capital, the impact on people and communities. But we do not value that in the same way as the financial performance.

So, what we argue at WBCSD – and this Vision 2050 was written with 40 global companies – is that we need to move to true value capitalism. Capitalism that is for the longer term and looks at internalizing the impacts of a business into the definition of its performance, that will hold boards accountable in their governance for not just the financial aspects of their business, but also their environmental and social aspects. The time for change in capitalism is happening in the next five years.

**So the next five years, that's the timeline as well for companies to get ready for this?**

I would argue certainly on climate change, you need to get prepared in the next 12 months. Otherwise, you're not going to be ready for the things that are being announced later this year. For nature and the

Task Force on Climate-Related Financial Disclosures (TCFD), we probably have a few more years, but I'm optimistic that three years from now, investors and financiers will begin to differentiate the cost of capital for a business, depending on their ESG or sustainability performance.

If a company is better able to manage its sustainability, to integrate sustainability into its innovation, into its product portfolio thinking, then it should attract the lower cost of capital because the risks the company is exposed to are much lower. That's why I think it's so interesting to be involved in WBCSD and I thank Bühler for being part of it. It's no longer a tree-hugging exercise, it's about integrating these ideas into the core economic thinking, because that's where the accelerator lies to make the world change.

***“SUSTAINABILITY IS NOT SOMETHING THAT YOU WATCH ON TV OR SOCIAL MEDIA, OR YOU READ IN A STRATEGIC DOCUMENT, IT BEGINS WITH THE CHOICES THAT ANY ONE OF US MAKES EVERYDAY.”***

**PETER BAKKER**

President and CEO of the World Business Council for Sustainable Development

**I think this complete rebranding of businesses is important because we've always been seen on the wrong end – and rightfully so in many cases, but we also have the power to drive tremendous good across borders and outside of election cycles. Now, just to change tack, as a member company of WBCSD, how do you see Bühler's contributions to the overall mission and where do you think we are on that journey?**

I'm really impressed by what Bühler is doing, and not just at the way you, your CEO, and the directors of the various business areas are able to talk about and think about sustainability as part of their business positioning. That in itself is impressive, but it's amazing to see your Generation B, and how young voices are being mobilized and actively changing the culture of the company.

Young people think very differently about these topics than probably you or I do, because they will have to live with the consequences if we get this wrong. That's a very powerful driver to get involved. I think what you're trying to do with your Networking Days, where you bring customers and suppliers

## NINE TRANSFORMATION PATHWAYS

- + **Energy** // We can power a net-zero world
- + **Transportation & mobility** // We can keep on moving, smarter
- + **Living spaces** // We can make the world feel at home
- + **Products & materials** // We can make things, better
- + **Financial products & services** // We can all invest in our future
- + **Connectivity** // We can connect people
- + **Health & wellbeing** // We can help people feel better
- + **Water & sanitation** // We can keep water flowing for all
- + **Food** // We can provide healthy diets for all

together to ask: what are the big challenges and how can innovation help? I think that's powerful. I think the targets – and not just the targets, because targets on margin are irrelevant – but the operating plans to reach the targets around climate change are among the most detailed I've seen.

Where I think you can do more is to really take a long horizon. And that won't change what you do today, but really say: Well, if all this stuff that is now happening in the Food Systems Summit, if that were to become reality, how would the food system transform? Probably it means we're going to eat a whole lot less meat, and we're going to change the agricultural processes. Whatever the consequences may be, make scenarios of what the system would be in 2030 or 2035. What is that going to do to the business models of the leading players today, and start-ups? And how can you then position Bühler with all the solutions, all the innovations that you have, to be part of that, maybe even a leading co-design partner of that future? And I think if you do that, you'll get to even more ideas that go beyond how we make the machinery more efficient, which is important. But as I said, the conversation has shifted to system transformation, and therefore you need to also look for transformational change.

What I can sense, and I hope people recognize that, is that there is a pride in this company. Having pride in the company and passion for the company in the culture and the DNA of everyone who works here, that's the best guarantee that you're going to find these solutions. I'm very impressed.

**Your feedback is extremely motivating and reassuring because of course, when we look at what we have ahead of us, we're making baby steps and pulling our partners and the industry together to drive impact, but there is so much more that we could do. Now, what is the role of individuals? How do they contribute?**

It's very easy for any organization to think: What can we do to shape a better world? But the reality – the hierarchy of things – is you first must change yourself, and then you may be able to change your company. Once you do that, you may be able to change your sector or your value chain, in which you operate. And once you've done that, maybe you should talk about changing the world. And so sustainability is not something that you watch on television or social media, or you read in a strategic document, it begins with the choices that everyone of us makes every day. What is the transport solution you choose? What is the car you have? Do you use your legs or your bicycle enough? Simple stuff. What is the diet you eat? And do you understand the environmental and the social aspects of the diet, as well as the health aspects?

And I'm not claiming nobody can eat meat or drink alcohol anymore, but understand what you're doing and the impact it has. And then make little changes there if you think you can. That gives you an understanding of a company that wants to make change. You think: 'I've made changes, and I know some of them are pretty hard to make, so it can't be easy for the company or its customers either.' Then you get an understanding, a collective understanding and then you begin to get ideas. 'I made this change, this works for me, maybe I can introduce it in the company.' I'm Dutch, and in the eighties, there was a Dutch public advertising campaign: Change the climate by changing yourself. I think whoever made up that line was very right. It begins with you and yourself.

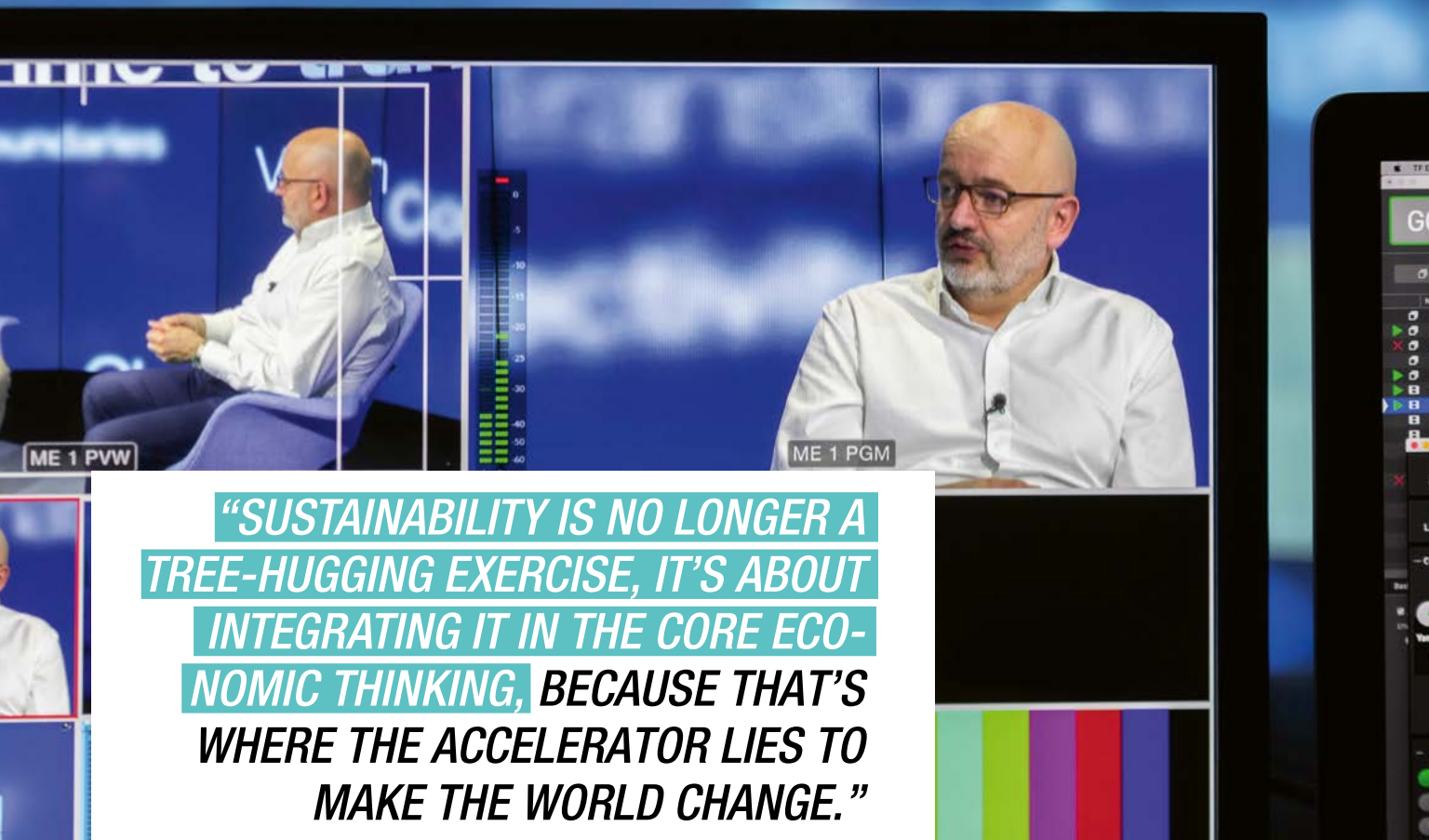
**I couldn't agree more. Now, you mentioned you're Dutch. You come across as very straight talking, very fact-based, but as I know you better, there's a huge burning passion for this topic inside you. What are the three things that give you the most hope?**

The way we're changing how we look at the world as a result of the pandemic gives me hope. The speed at which the vaccines have been developed is unprecedented. And in June, the G7 heads of state met and declared their determination to beat Covid-19, "build back together", aim for a net-zero world, and a nature-positive world. That's a sudden change of conversation that I think would not have happened were it not for the Covid-19 crisis.

The second big area of hope is probably the second and the third and the fourth and the fifth; it's coming back to my passion, it's the fact that the way





**PETER BAKKER**

President and CEO of the World Business Council for Sustainable Development

we talk and think about the capitalist system is moving faster than I ever thought possible. The fact that we will be launching an accounting standards board for non-financials, the fact that the TCFD – the governance model of the future – will be made mandatory later this year – gives me enormous hope. Bühler is one of the exceptions, but today, sustainability is too dependent on whether the CEO or the executive team get it and have the ability to then change the strategy and the direction of their companies. If you’re working in a company like Bühler, who gets it, it’s fabulous. If not, you’re not going to be able to achieve much change.

The minute the accounting rules become standardized, materiality-based, and mandatory for disclosure, then we will know the next day which company is serious about this, making progress – maybe struggling, but making progress – and which company doesn’t have it on the agenda at all. The leadership is then no longer selling stories to show that they are doing something, but we’re going to see performance being measured and hopefully improve. And the ones who are best positioned, they will be visibly the best. They will attract more capital, will

be able to invest more, and as such, will accelerate the transition. The move to a capitalism of true value for all will accelerate the transformation toward 9-plus billion people all living well, within planetary boundaries, faster than anything else.

**VISION 2050: TIME TO TRANSFORM**

Read the bold and urgent transformation agenda developed by the World Business Council for Sustainable Development in 2021.

**VIDEO**

Scan the QR code to watch the full interview between Ian Roberts and Peter Bakker.



*When Bühler announced the ambitious targets of reducing waste, water, and energy consumption by 50 percent in its customers' value chains by 2030 two years ago, one of the first orders of business was to establish a system to measure how much CO<sub>2</sub> is emitted relative to any specific manufacturing activity. This is known as the emission factor, or CO<sub>2</sub>e. Today, Bühler's CO<sub>2</sub>e Quantification Program is rapidly gaining traction.*



*quantification*

# THE FOUNDATION FOR **A BETTER FUTURE**

TEXT: LUKAS HOFSTETTER  
PHOTOS: JUDITH AFFOLTER





***“IT’S IMPORTANT TO CONSIDER THAT CO<sub>2</sub> IS JUST ONE ASPECT OF SUSTAINABILITY AND THAT OTHER CRITERIA SUCH AS LAND USE OR SOCIAL SUSTAINABILITY ARE ALSO PART OF THE STORY.”***

**JAY O’NIEN**

Head of the CO<sub>2</sub>e Quantification Program at Bühler

**“INDUSTRY MUST BECOME** part of the solution,” said Bühler’s CEO Stefan Scheiber at the Networking Days 2019 in front of over 800 decision makers and partners of the global food and mobility industries. Everyone in the room agreed that urgent changes are needed to mitigate the effects of climate change – from farm to fork, and from raw material to final product. Following the fundamental business doctrine, “if you can’t measure it, you can’t improve it,” a dedicated team got to work to quantify the CO<sub>2</sub>e in the value chains of Bühler’s customers, and the company’s own CO<sub>2</sub>e footprint.

Now that the framework has been tested and applied in specific businesses, and with Bühler’s customers feeding 2 billion people and moving 1 billion people every day, the potential for profound action to significantly reduce CO<sub>2</sub> emissions across entire industries is seemingly endless.

#### **From croissants to electric cars**

In his first meeting with Bühler’s CTO Ian Roberts after being tasked with creating a system that measures the CO<sub>2</sub>e of all emissions combined, Jay O’Nien, Head of the CO<sub>2</sub>e Quantification Program at Bühler, opted for emotionalizing the team’s findings by using the example of a croissant. “It was a

good product to start, because there were many CO<sub>2</sub> hotspots at different parts of the value chain, for example aggregated emissions in the raw materials, the CO<sub>2</sub> added in the raw material transformation from wheat to flour, the CO<sub>2</sub> added in the baking step, and even including the disposal of the plastic packaging,” he says.

While Roberts did indeed enjoy the croissant, he continued to test the methodology by tasking O’Nien and his team to compare the emissions of electric cars and petrol cars. Soon after, the team set the goal of being able to map out and measure CO<sub>2</sub>e across Bühler’s key value chains, which cover around 90 percent of the products processed on Bühler technology.

#### **Impact on the entire value chain**

To ensure a systematic approach across Bühler’s diverse businesses, the team set up three different scopes in its analysis. “In the technology scope, we study how new Bühler technologies and services contribute to our company goals to reduce energy, waste, and water by 50 percent, compared to technology before 2017. For example, when the SWAKT-Eco oven was introduced, it cut gas consumption by 20 percent relative to its predecessor,”



says O’Nien. “This really is a step-change in the wafer business and has a significant impact, but to measure consistently against other CO<sub>2</sub> reduction measures, we use CO<sub>2</sub>e and measure in the plant and in the entire value chain.”

One of Bühler’s latest innovations provided the team with detailed insights on the plant level. “Mill E3, for example, reduces CO<sub>2</sub>e produced within the mill by 9 percent. This is an important calculation for our customers, who are themselves under pressure to demonstrate to the market that they are taking steps to reduce their own carbon footprint,” he explains. The third scope takes into consideration the entire value chain. O’Nien and his team look at one of the major staple foods to highlight the importance of this scope: wheat. “The global average emission factor for wheat production is 700 kilograms of CO<sub>2</sub>e for every metric ton. Findings like these enable us to break these emissions down into geographical regions and determine where we can have the biggest impact together with our customers.”

O’Nien highlights that a holistic view is crucial in creating meaningful impact. “It’s important to consider that CO<sub>2</sub> is just one aspect of sustainability and that other criteria such as land use or social sustainability are also part of the story. We developed the CO<sub>2</sub>e quantification method with an external partner, the sustainability consultancy Quantis.” Bühler will also continue to work with external partners to ensure that all aspects of sustainability are considered.

### **Making customers’ lives easier**

As with every new solution or service that Bühler introduces, the deciding factor is how customers react to it. “Our customers and partners have long realized that we need to significantly increase the level of collaboration and innovation across industries to reduce our carbon footprint. When we introduce our CO<sub>2</sub>e Quantification Program to them, their eyes light up because they’re all burning to take action but sometimes lack a system or the expertise to provide them with an analysis of their emissions,” says Roberts.

A look at the die-casting industry shows the importance of cutting CO<sub>2</sub>e. “When the German car manufacturer Daimler announced their plans to become carbon neutral by 2039, it immediately translated down the many supply chains in the car industry, including our die-casting customers. They didn’t have a systematic measuring system in place to quantify emissions, and welcomed our input,” says O’Nien. With three CO<sub>2</sub>e quantifications being certified according to ISO standard 14067, Bühler can talk to customers with confidence, and customers can be assured that they are compliant

with international standards and can focus on serving their own customers. While measuring its CO<sub>2</sub>e provides customers with the foundation to take action, Bühler started to quantify the avoided CO<sub>2</sub> emissions in January 2021.

“This is the amount of CO<sub>2</sub> emissions that is not being pumped into the atmosphere because of new Bühler technologies and services that efficiently process our customers’ products. This metric highlights the importance of retrofit technologies on existing processes and shows that retrofits are one of the fastest ways to cut emissions,” Roberts explains. “Avoiding emissions is the first priority in the emission’s hierarchy. The next is the need to reduce CO<sub>2</sub> through efficient processing. Lastly, there is the need to draw down existing emissions from the atmosphere, together with companies such as Climeworks or Ecosystem Regeneration Projects from the Crowther Lab.”

With a proven and certified service in place, huge demand from customers and ever-increasing political and societal pressure, Bühler’s CO<sub>2</sub>e Quantification Program is set for continued growth across industries. “Our main goal now is to connect our service to our digital platform Bühler Insights, and provide our customers with real-time analysis of their data,” says O’Nien.

Bühler’s Networking Days 2022 in June will provide his team with the unique opportunity to get more customers on board and continue walking the talk that CEO Stefan Scheiber meant with his call-to-action on that summer day in 2019: “Industry must become part of the solution.”

### **INFO**

**Bühler wants to ensure** that its own activities are in accordance with best practice in quantifying and reducing CO<sub>2</sub>e emissions. A dedicated team in Manufacturing, Logistics, and Supply Chain (MLS) is working on sustainability with the target of achieving net-zero emissions by 2030 – which means Bühler needs to reduce its emissions related to MLS processes by at least 50 percent and neutralize the remaining emissions with technologies that remove CO<sub>2</sub> from the atmosphere. The team has built a methodology that enables them to quantify emissions and shows that Bühler’s jump-off point in 2019 is 810,000 tons of CO<sub>2</sub>e.



# A GLASS **CHOCOLATE FACTORY**

TEXT: CARMEN PÜNTENER  
PHOTOS: THOMAS EUGSTER

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*There is a new monument to chocolate production in Kilchberg, Zurich – the Lindt Home of Chocolate. The Lindt Chocolate Competence Foundation has created a competence center for Swiss chocolate manufacturers that is rich in tradition. It features an interactive exhibition, a research facility, and a highly flexible chocolate production plant fully equipped by Bühler.*



  
TIER SUISSE  
45



Their companies have a lot in common. Lindt & Sprüngli Group CEO Dieter Weisskopf and Bühler CEO Stefan Scheiber regularly exchange ideas.



The chocolate fountain in the main hall is 9-meters-high and a real crowd magnet.

**IF THERE IS A CHOCOLATE HEAVEN,** it's very likely in Kilchberg. Over several years, a highly sophisticated building was developed at the historic location of Lindt & Sprüngli in Switzerland. It is dedicated to the history and production of chocolate. Realized and financed by the charitable Lindt Chocolate Competence Foundation, the Lindt Home of Chocolate is both a museum and a research center.

"We want to show the world that Swiss chocolate is one of a kind," says Ernst Tanner, President of the Board of the Lindt Chocolate Competence Foundation and Executive Chairman of the Board of Directors of Lindt & Sprüngli. "Another aim that we as Swiss chocolate manufacturers have, is to remain innovative and assert ourselves as world leaders in terms of processes, technology, and recipes. That's why we have worked with Bühler to realize the pilot plant for testing new products in the facility."

#### **Dive into the world of chocolate**

On entering the building, visitors are immediately immersed in the golden magical world of chocolate. A 9-meter-tall chocolate fountain with a whisk that appears to be suspended in air is the focal point of the entry hall. One of the famous *Maîtres Chocolatiers* greets visitors in the gallery.

Nestled in the light-flooded building designed by renowned Basel architects Christ & Gantenbein, the Lindt Home of Chocolate offers everything a chocolate-lover's heart desires. It houses a museum, a free-standing chocolate fountain, the largest chocolate shop in the world, and a café. And the focal point, created with Bühler, is a 15-meter-long moulding plant visible to the public through glass walls. Visitors can watch as chocolate is produced with Bühler technology.

Even chocolate experts rave about it at their visit to the Lindt Home of Chocolate. "The building is very symbolic and stands for over a century of pioneering work and innovation in chocolate production. It is a homage to Switzerland as a bastion for industrial chocolate production. We are very proud to be so well represented here in the pilot plant with our technology," says Germar Wacker, CEO of Consumer Foods at Bühler.

The exhibition and show plant cover an area of around 1,500 square meters. The museum provides information on cocoa cultivation, the history of chocolate and Switzerland's chocolate pioneers, and chocolate production. The new construction is a popular destination for tourists, families, and schools, and is also a facility for specialists and scientists who visit the research premises to test their latest chocolate recipes.







**“WE WANT TO SHOW THE  
WORLD THAT **SWISS CHOCO-  
LATE IS ONE OF A KIND.**”**

**ERNST TANNER**

President of the Board of the Lindt Chocolate Competence Foundation  
and Executive Chairman of the Board of Directors of Lindt & Sprüngli

**LINDT & SPRÜNGLI GROUP**

**Lindt & Sprüngli** is established in more than 120 countries with 11 production sites in Switzerland, Europe, and the US with 14,600 employees globally. The company has been listed on the Swiss Stock Exchange since 1989 and has grown enormously since then. Among other investments, Lindt & Sprüngli has acquired the Viennese Hofbauer Confectionery, Italian chocolate manufacturer Caffarel and in 1998, it took over the Ghirardelli Chocolate Company in San Francisco, the second-oldest chocolate factory in the US, followed by Russell Stover in 2014. The group turnover was CHF 4 billion in 2020.

The group has enjoyed global growth, traditional Lindt brand chocolate products are still some of the most popular sweets in the domestic market. In fact, the Swiss, closely followed by the Germans, remain the greatest champions when it comes to eating chocolates. They consume an average of 9.9 kilograms of chocolate per person per year.



The new facility in Kilchberg, Zurich, was inaugurated in September 2020.



**“ULTIMATELY, IT’S THE TECHNOLOGY THAT CREATES SUCCESS, WHICH IS WHY WE WOULDN’T BE WHERE WE ARE TODAY WITHOUT BÜHLER.”**

**DIETER WEISSKOPF**

Group CEO of Lindt & Sprüngli

The Lindt Chocolate Competence Foundation invested more than CHF 100 million in the prestigious building project. Its focus is not just on Lindt – respect is also paid to the well-known founders of industrial Swiss chocolate production.

First and foremost, François-Louis Cailler (1796-1852), the founder of the oldest existing Swiss chocolate brand. Other pioneers are also presented in the exhibition: Charles-Amédée Kohler (1790-1874, inventor of hazelnut chocolate), Henri Nestlé (1814-1890, patron of innovations in chocolate production), Daniel Peter (1836-1919, inventor of milk chocolate), Philippe Suchard (1797-1884, inventor of the mélangeur mixing machine), as well as Jean and Theodor Tobler (1830-1905 and 1876-1941, inventors of Toblerone). “All of our chocolate pioneers focused on quality,” says Ernst Tanner. “This is the reason we have established ourselves globally with Swiss chocolate production. It is therefore important to pay tribute to all these pioneers.”

The opening of the Lindt Home of Chocolate falls right on Lindt & Sprüngli’s 175-year anniversary. David Sprüngli opened his first sweet shop in 1845 in Zurich where he sold solid bars of chocolate, a first in German-speaking Switzerland. The business grew so fast that Sprüngli could inaugurate his first chocolate factory just two years later.

Chocolate was also a bestseller in other parts of Switzerland. In Bern, Rodolphe Lindt, the son of a pharmacist, meticulously worked on methods to make the beloved treat even tastier. In 1879, Lindt left his factory on a Friday evening without switching off the machine he had invented for mixing chocolate mass. The machine mixed over the entire weekend and the chocolate that Lindt found on Monday was finer and more exquisite than ever before. This is how Rodolphe Lindt discovered conching, and heralded the beginning of a new era with incomparably delicate, melting products. In 1899, Johann Rudolf Sprüngli, David’s son, bought the Lindt factory and secret recipe for 1.5 million gold francs, thus laying the cornerstone for Lindt & Sprüngli.

In the decades that followed, Lindt & Sprüngli continued to lead the market with their innovations. A new secret recipe was developed in 1949: the Maître Chocolatiers wanted to create something heavenly. They conducted experiments until they perfected a chocolate bar more luxuriously smooth than ever before. It was called LINDOR. 20 years later, this recipe was used for the world-famous LINDOR truffle.

#### **The gold bunny sees the light of the day**

The gold bunny followed in 1952, and is currently one of the best-selling Easter specialties. Around 160 million Lindt gold bunnies are produced every year and sold in over 60 countries worldwide. But that still wasn’t enough. Another successful classic is the Lindt Excellence dark chocolate bars with a high cocoa content of 70 to 90 percent, first introduced to the market in 1989. Today, they come with every possible ingredient, ranging from Fleur de Sel, chili or caramel to lemon, grapefruit, fig, and pear.





The pilot plant is also a research center. Lindt Caramel Squares are currently produced here.

The collaboration between Lindt & Sprüngli and Bühler began over half a century ago. At the time, the Eastern Switzerland-based technology manufacturer was already well established as a specialist for chocolate processing plants, and had proven that there was no better provider in the world when it came to efficiency and accuracy. According to Ernst Tanner, the collaboration goes beyond a simple supplier/customer relationship. "We have regular meetings where we discuss what can be improved, because Bühler also needs feedback from manufacturers. If we have an idea for something new, for technology we wish to implement in three to five years, we go to Bühler and sit with the experts to develop something new together."

It is also important for Ernst Tanner that the companies have the same values. "Bühler has a very similar philosophy to ours. It's about people, teamwork, continuity based on know-how and team-play." The personal relationship in this partnership is important, agrees Dieter Weisskopf, Group CEO of Lindt & Sprüngli. "Chocolate production technology is basically the same process as it was 150 years ago. Of course, there is a difference between production then and now: volumes are higher and the machines are more efficient. Ultimately, it's the technology that creates success, which is why we wouldn't be where we are today without Bühler."

#### **A plant for the people**

It has been full speed ahead at the new pilot plant in the Lindt Home of Chocolate since January 2020. The plant is a huge step forward for research and development: "Previously, producers had to manufacture small batches on their large chocolate lines if they wanted to try something new," says Ernst Tanner. "That is very costly, time-consuming and not as flexible as it needs to be. Now, they can do all of this here. So far, we have already conducted more than 100 test days."

Innovation is essential in the current market. Consumers want a large variety of flavors, but also special products such as vegan or reduced-sugar chocolates. Sustainable and traceable supply chains



must also be taken into account. All this leads to a larger variety of products that the manufacturer needs to bring to market. This in turn means that chocolate manufacturers must produce smaller batches. “For us, this means that we have to build even more flexible plants,” says Bühler CEO Stefan Scheiber. “We have to design the production lines to be more modular than before so that our customers can reduce the costs for cleaning processes and product changes.”

#### **Learn from the masters**

It is these requirements that have been implemented in the pilot plant in the Lindt Home of Chocolate. Anita Cavegn, Manager Corporate Technology at Lindt & Sprüngli, is very excited about it.

“The pilot plant is extremely flexible and equipped with different technologies. For example, we can exchange individual modules in the moulding line and put them together as required. It’s unparalleled.” When realizing the project, Bühler had to take several aspects into account, says Germar Wacker. “The requirements of the plant were clear: maximum flexibility, highest functionality, and suitable design quality for the Lindt Home of Chocolate. This means the best possible presentation was required as the production takes place in a glass factory where visitors can watch every step.”

The pilot plant boasts another big advantage. It can provide training. “I’m glad that our partnership in research, training, and development can grow thanks to the pilot plant,” Wacker explains. “Through the collaboration with leading univer-

sities, we have excellent talents on board who address current consumer trends as well as sustainable value chains. These trends offer tremendous opportunities and we are well prepared to develop these growth markets with our customers.”

With all this knowledge-sharing going on, you might be thinking that there is something missing in the Lindt Home of Chocolate – the actual delight of eating chocolate. You could not be more wrong. Everyone gets their money’s worth here. After visiting the museum, there is a sample station where visitors can taste some of the latest creations of the *Maîtres Chocolatiers*. And, if you want another memorable experience, you can attend the truffle-making course in the Lindt CHOCOLATERIA and make your own chocolates there. As English poet John Milton so perfectly put it, “Biochemically, love is just like eating large amounts of chocolate.”

***“IT IS A HOMAGE TO SWITZERLAND  
AS A BASTION FOR INDUSTRIAL  
CHOCOLATE PRODUCTION. WE ARE  
VERY PROUD TO BE SO WELL  
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PLANT WITH OUR TECHNOLOGY.”***

**GERMAR WACKER**

CEO Consumer Foods at Bühler





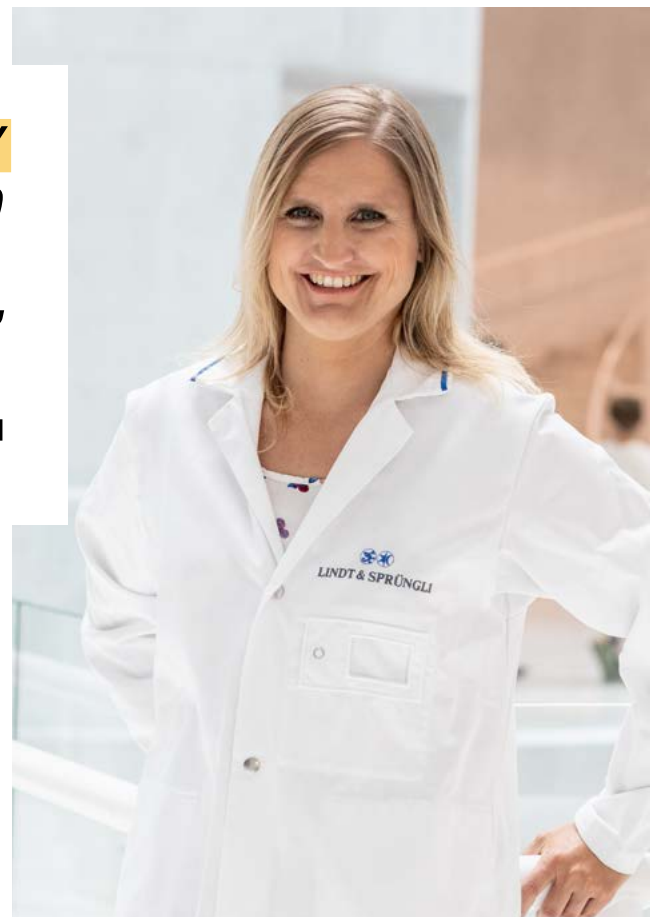


Visitors can watch chocolate delights being produced in the pilot plant.

***“THE PILOT PLANT IS EXTREMELY FLEXIBLE AND EQUIPPED WITH DIFFERENT TECHNOLOGIES. IT’S UNPARALLELED.”***

**ANITA CAVEGN**

Manager Corporate Technology at Lindt & Sprüngli



#### VIDEO

##### A PEEK INSIDE THE LINDT HOME OF CHOCOLATE



A tour of the Lindt Home of Chocolate with the Lindt & Sprüngli and Bühler experts.



Interview with Ernst Tanner, President of the Board of the Lindt Chocolate Competence Foundation and Executive Chairman of the Board of Directors of Lindt & Sprüngli.



Interview with Dieter Weisskopf, Group CEO of Lindt & Sprüngli and Stefan Scheiber, CEO of Bühler.

**\_connect**

**3, 2, 1, AND**

**ACTION!**

TEXT: CARMEN PÜNTENER  
PHOTOS: JEKATERINA GLUZMAN

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*The coronavirus pandemic has forced many countries to impose strict travel restrictions. This put Bühler experts from the Nutrition Application Center in Switzerland in a challenging position, since customer requests for product trials continued to soar. Plant-based meat alternatives are booming, and extrusion technology is in great demand. What could be done? Those responsible decided without further ado to offer virtual trials.*

**SINCE APRIL 2021,** the Nutrition Application Center at Bühler in Uzwil, Switzerland, looks like a TV studio. Several cameras are set up around the extruders and driers. Cables connect them to a vision mixing switch board, and professional microphones with noise reduction are standing ready. A laptop is installed to send images via Microsoft Teams to all corners of the world where customers connect to watch their trials virtually.

“An increasing number of customers were already cutting down on the amount of travel, for cost or environmental reasons, but it was really the pandemic that caused us to set up our virtual trial solution,” explains Robert Mitchell, Extrusion Technologist at Bühler. “We had several cases where a customer would have had to cancel trials, and we







***“IT’S JUST SO COOL THAT A  
CUSTOMER IS ON THE OTHER  
SIDE OF THE WORLD AND **WE ARE  
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WHAT’S HAPPENING.**”***

**ROBERT MITCHELL**  
Food Technologist at Bühler

had to find a solution to make sure that they wouldn't have to wait six more months to find a new slot." Robert Mitchell and his colleagues are now almost permanently in action. Raw materials are sent to Uzwil by customers, and the extruders are customized for each individual session. This was also done previously. But now, the food technologists also learned how to operate the cameras and microphones. "At first it was of course quite new, and we didn't know how to connect all the cables, but we had great support from our audiovisual experts," Mitchell recalls.

### Customers decide what's on their screen

Today, Mitchell uses the cameras and the switchboard like a pro. "It is a very handy set up. We have a switchboard where we can click on a button for each camera, so we can always show the view the customer wants." In the virtual meetings, the team usually shows a view of the extruder panel, for all technical specifications and trending graphs, and one of the cameras according to the customer's wishes. "I am a tech geek at heart. I love everything digital," Mitchell explains, who is enthusiastic about the new set up. "It's just so cool that a customer is on the other side of the world during the trial, and we are still able to show them live what's happening."

The virtual trials offer three different main camera views: close-ups to see the product when it leaves the machine, a separate view of the drier when relevant, and a top-view camera to focus on product samples placed on the table. In addition to the installed cameras, Mitchell even sometimes uses the Microsoft Teams mobile app on his phone to show customers the specifics that were not set up for view beforehand.

It is no coincidence that the team around the Nutrition Application Center initiated these trials. Extrusion technology is booming, particularly as more companies are racing to get into the lucrative plant-based meat alternative market. Time slots for product trials are rare, and the Application Center is booked months in advance.

### More information in less time

One customer who has already conducted virtual trials is France-based Nutriset. The company produces fortified products made with grains, pulses and vegetables to fight malnutrition in Sub-Saharan Africa. With 18 partners in 11 countries, Nutriset aims to build a sustainable agriculture industry in emerging countries that supplies high-quality food made with local raw materials, produced in local plants. "We cook these raw materials through extrusion technology to improve digestibility, and to eliminate harmful bacteria," says Aurore Frixon, Food Technologist at Nutriset. The extruded flours are

used later as an ingredient for their finished products, which are enriched with various macro- and micronutrients. The company has its own pilot extrusion line from Bühler in the French region of Normandy. For a new, still confidential project, they did the first tests in their own facilities. "But we wanted to validate the feasibility of this project, and therefore had planned trials in Switzerland to see if that specific local raw material would also work in a scaled-up environment," says Frixon.

Due to the French travel restrictions, she and her team decided to conduct the trials virtually. "We know that Bühler always sets the bar very high, but wow, we were really impressed with all the technology Bühler installed to make us feel like we were there." According to Frixon, next to seeing different angles and parts of the production process, it was also essential to not just rely on web cams. "If you look at extruded products it is very important to see the details. So, we really appreciated the usage of high-resolution cameras and the additional pictures the Bühler team sent us."

**"WE WERE REALLY IMPRESSED  
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**AURORE FRIXON**

Food Technologist at Nutriset

Frixon emphasizes the efficiency of this set up, since it saves travel time and costs, and it makes it possible to start writing a rough draft for the report during the online session. Still, she missed one thing a lot. "The taste of the product, of course. It is so important for us, since our consumers are small children in the first place, and to be sure that kids will eat our products, they have to be tasty," she says.

Of course, the Bühler technologists tasted the product instead and described all of its organoleptic qualities, and after the virtual trial, the product was vacuumed and sent to France. "This all really worked perfectly." Still, Frixon enjoys the personal interactions: "We are all passionate extrusion experts, so I really appreciate being with the Bühler team, to have this exchange and discuss details," she says. For the next project, Frixon and her team would like to travel to Switzerland again.





Since the start of the virtual trials, 25 percent of the customers who booked trials have opted for the online version, and well over 200 products have been tested. According to Mitchell, the reactions were positive throughout: “Another benefit they indicated to us was those members of the customer’s team, or from top management, who would not necessarily have to be part of the trial session, could join for specific parts, or for a summary, without spending too much time on it,” he says.

After four months, the virtual trials have become part of the Bühler Food Technologist’s daily routine: “It’s no longer new and scary. And we have many new ideas such as using smart glasses. These would also help to improve the customer experience,” Mitchell says. And, he knows that there are plans for more digital connectivity. “We had some customers who were so impressed that they actually want a similar setup in their plants in order that we can give them better remote support. We’re also working closely with other Bühler Application Centers to offer the same installation for further business branches in the future.”

Customers can decide for themselves what they want to see on the screen.



## INFO

### RemoteCare


When it comes to remote services, not only are product trials high in demand, but the need for remote support has also increased. Bühler has therefore set up RemoteCare, a service package fully aimed at supporting its customers anytime, anywhere. RemoteCare is a service solution that provides customers with remote troubleshooting services for technical, automation, and digital incidents. It adds the possibility to support customers in times of unplanned breakdowns, increases uptime, and secures operation 24/7.

RemoteCare is a flat-fee based service contract and is available in three different packages, starting with business hours support (Light), 24/7 support (Anytime), and finally, dedicated expert support (Pro).

All packages guarantee a fast response. Bühler’s regional specialists support customers on the first level within a maximum of 2 hours’ response time. In case escalation is needed, business headquarter specialists will be involved quickly and provide specialized support on the second level. Bühler has 500 remote support engineers worldwide, all highly trained, each of them attending 15 days of training every year.

**For more information,  
please visit our  
RemoteCare site.**





The Sortex at Gerelli guarantees maximum quality and food safety in its nut-processing facility.

*versatile*

# NUTRITIOUS & DELICIOUS

TEXT: BIANCA RICHLÉ  
PHOTOS: THOMAS EUGSTER

*PERFECTLY ROASTED*





# PEANUTS

*Gerelli is one of the most up-to-date roasters of peanuts in Europe. Using Bühler's new Solano roaster – Gerelli not only increased the productivity of its pea-nut processing, it scored points with its customers by offering individual roasting profiles. And thanks to Solano, the company now has the option of processing other nut types as well as oilseed in the off-season.*

**NUTS ARE REAL POWERHOUSES.** Chock-full of vitamins, proteins, minerals, and healthy fats, they are an ideal snack for sports and also mental gymnastics. Vegan, gluten-free, and low-carb, nuts can be integrated into almost any diet. No wonder they are becoming increasingly popular. According to Statista, the portal for market data, a per-capita consumption of 1.1 kilograms worldwide is expected in 2021. And the trend is continuing to grow with sales forecasted to grow by over 3 percent per year by 2025.

To make this snack safe and tasty, Bühler developed the Solano roaster and pasteurizer. In doing so, the Bühler team was able to draw on its many years of experience in roasting nuts and on its expertise in roasting cocoa beans and coffee. Solano also has some features that are new for this type of nut processing. For example, the ability to create individual roasting profiles. This has long been an established practice in coffee roasting and is an indispensable process. In the nut market, consumers are only now benefiting from this thanks to the Solano roaster.

“It was clear to us from the start that we would only consider Bühler solutions for our needs,” says Raphael Weiss, the CEO of Gerelli AG Die Rösterei. “We are from Eastern Switzerland and Bühler is well known here and has an excellent reputation.”

The leading Swiss peanut roaster believes that standing still is like taking a step backwards and is therefore constantly investing in new technologies. And Weiss has clear ideas about what the overall solution should offer – maximum food safety, best roasting quality, and a high degree of flexibility were non-negotiable requirements.

“We have very high standards in terms of quality. Quality begins in the field, followed by how the nuts are processed and cleaned. We have clear guidelines for each individual step,” says Weiss. Gerelli employees visit the country of origin of the nuts they process, Egypt, once or twice a year, where they train their producers on food safety and quality requirements. “We have been able to steadily raise quality over the years and have also succeeded in introducing organic nuts, which is an achievement.”

The company also wanted their overall solution to stem from a single source. “We are very happy to have found in Bühler a company that provides a comprehensive solution that meets our requirements,” the CEO says.

### Gentle processing

“Since we offer peanuts in shells, it is particularly important to us that the shells remain intact,” says Weiss. The integrity of the shells has a direct effect on the company’s margins. Bühler’s Sortex E1C plays an important role in this. With the help of its highly advanced 4-in-1 technology package, it sorts out nuts that have a different color due to bacterial infesta-

tion or dryness, which means it is no longer fresh. It also eliminates foreign bodies such as plastic parts or stones. Its integrated PROfile technology detects defects that cannot be identified by color alone, such as peanut stalks and nuts that have grown too small or too large. The sorting process guarantees maximum quality and food safety in every nut-processing facility.

The heart of nut processing is the roaster. It refines the product and creates the typical nutty taste. “We put a lot of focus on gentle heating to ensure that the nuts are not stressed and that the nutritional value, product quality, and aroma are preserved,” says Weiss.



Raphael Weiss, CEO of Gerelli AG Die Rösterei, plans to process other types of nuts in the future.





**“SINCE WE OFFER  
PEANUTS IN SHELLS, IT IS  
PARTICULARLY **IMPORTANT**  
TO US THAT THE SHELLS  
**REMAIN INTACT.**”**

**RAPHAEL WEISS**

CEO of Gerelli AG Die Rösterei


Highest food safety,  
top roasting quality, and  
maximum flexibility – these  
are Gerelli's requirements.

Gerelli and Bühler worked meticulously, testing and retesting until they had developed a solution that would not negatively affect the product during the mechanical action of the roasting process. “We have been successful in giving the nuts an excellent flavor and a nice appearance,” says Weiss, visibly proud. An additional benefit: Thanks to the gentle processing with the patented roasting process, the microstructure of the nuts and seeds is largely preserved, thus ensuring an unsurpassed shelf life. The oxidation rate of the nuts decreases by a factor of 2.5 in comparison to conventional roasting processes.

Weiss greatly appreciates the fact that his company can now create individual roasting profiles. This gives Gerelli's customers the opportunity to offer their end consumers a product that is perfectly tailored to their wishes in terms of aroma. “This represents a major added value for our customers and therefore also for us,” says Weiss. “Our initial experience has been very positive. Now it's up to us to become better acquainted with the technology and what it offers so that we get the most out of it.”

#### INFO

**Gerelli AG Die Rösterei** is the largest peanut roaster in Switzerland. It roasts over 1,500 tons of peanuts in their shells and supplies them to over 100 wholesalers and bulk purchasers at home and abroad. Founded in 2003, the company has been owned by the Weiss family since 2016. Gerelli constantly invests in its infrastructure to ensure the freshness and quality of its product. In 2020 it commissioned its new, fully automated nut processing facility.



***“WE ARE VERY HAPPY TO HAVE FOUND IN BÜHLER A COMPANY THAT PROVIDES A COMPREHENSIVE SOLUTION THAT MEETS OUR REQUIREMENTS.”***

**RAPHAEL WEISS**  
CEO of Gerelli AG Die Rösterei

The Solano offers flexibility when it comes to roasting and pasteurizing. “In addition to roasting, we can also use the Solano for pasteurizing depending on the customer’s requirements,” Weiss explains. “Among other things, we will be able to eliminate Salmonella infections by pasteurizing.”

If a company wants to offer nuts in raw food quality, this is also possible with the Solano. In this case, it is only pasteurized. The patented pasteurization technology achieves an over 5-log inactivation of pathogenic microorganisms such as Salmonella. This is the gold standard in the food industry, which guarantees the highest possible level of food safety. In specific terms, this means that up to 99.999 percent of bacteria and germs are killed. This is made possible by the introduction of steam in several places in the processing chamber at the same time, which achieves uniform and gentle pasteurization.

“Recirculation of the process air makes the pasteurization and roasting process energy efficient and sustainable,” says Patrick Strähl, Senior Process Engineer at Bühler, who co-developed Solano. The batch system with lot sizes of 300 to 600 kilograms and the intelligent automation with recipe management allows a rapid product changeover. The Solano roaster meets the criteria of hygienic design and is easily accessible for cleaning.

#### **Other types of nuts and oilseed**

The demand for peanuts in shells varies greatly by season. In Switzerland, they are sold in large quantities from October to January as they are typical gifts from “Samichlaus” – the Swiss version of Saint Nicholas. The Samichlaus visits all the children on December 6th and brings them peanuts in shells, mandarins, and chocolate. Sales are rather low outside this peak season in Switzerland, so Gerelli’s primary production is focused on September to January to ensure that only fresh nuts are delivered to shops.

Solano is a multitasking solution.  
It can roast, pasteurize, and  
process various types of nuts  
and oilseeds.



This means that for for a large part of the year, the production plant is on a low flame. “Thanks to the Solano roaster we can now process other types of nuts and even oilseed in the off-season,” says Weiss. “This is, of course, a huge added value for us. We plan to include oilseed and other nuts in our product portfolio.”

#### **High-end and fully automatic**

When you enter the state-of-the-art Gerelli plant, you will notice that there are almost no employees to be seen. “Our plant is fully automated. We operate the plant only with one person,” says Weiss. “The high degree of automation allows a high throughput of the best quality. We save costs since only a few manual interventions are required.”

The only place where we find some employees is in the quality control department. Gerelli has two employees for quality control. “We check the quality of the product constantly by hand to ensure that it is consistently flawless and safe,” says Weiss.

**“RECIRCULATION OF THE  
PROCESS AIR MAKES THE  
PASTEURIZATION AND ROASTING  
PROCESS ENERGY EFFICIENT  
AND SUSTAINABLE.”**

**PATRICK STRÄHL**

Senior Process Engineer at Bühler

#### **Crunchy and fresh**

Gerelli is committed to supplying the freshest and crunchiest nuts in Switzerland to its customers. It is important that the raw unroasted peanuts do not rattle in the shell. If this is the case, it is an indication that the nut is dried out. Light-colored flesh is also an important feature of its freshness. The yellower the inside of the nut, the older it is.

Gerelli is particularly proud of the light color of its peanut shells. The secret lies in the peanut plant. It adapts the color of its fruits to the environment. The Gerelli nuts are cultivated in the Sahara Desert where the sand is very light in color. These interesting details make you wonder where the nuts and seeds that Gerelli will offer in the future might come from and what special properties they will have. Whatever they may be, Bühler will be there to support Gerelli along its journey.



#### **VIDEO**



See Gerelli's state-of-the-art, fully-automated facility firsthand in the video.



*\_efficiency*

# ***SAVING THE***

# ***PLANET***

TEXT: STUART SPEAR

# **THROUGH DEGREES OF CHANGE**

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*The unbeatable duo cuts emissions by driving down the energy costs of producing printing ink, a product used in nearly every aspect of our lives. Together, the MacroMedia and the MicroMedia Invicta boost productivity by 175 percent per line and slash energy costs by 50 percent for every ton of ink produced.*



**“WE LIKE TO FEEL THAT THE WET GRINDING PROCESS TECHNOLOGY IS DOING ITS BIT AND CONTRIBUTING TO THE OVERALL SUSTAINABILITY TARGETS THAT WE ARE AIMING TO REACH BY 2025.”**

**ANGELA ZÜRRER**

Product and Strategic Marketing Manager  
for Grinding and Dispersing at Bühler

**FOR BÜHLER** to successfully cut energy wastage by half by 2025, radical reductions in energy consumption will need to be achieved in every part of the value chain. For most, the production of printing ink has gone unnoticed when it comes to debates about sustainability. And yet, we are surrounded by it every day. It's on the food packaging that advertises content in bright graphics, the publications that tumble off the printing presses, printing ink and dyes are used in our homes, our offices and on the textiles we wear. It is ubiquitous and Bühler has been looking at how to halve production energy costs with the introduction of what is described as its “unbeatable duo”, the MacroMedia pre-dispersing unit and the MicroMedia Invicta high-performance bead mill. This wet grinding process is also used for coatings and chemical applications, but the most common usage is in the manufacture of printing ink.

The environmental and cost-saving credentials of the unbeatable duo are impressive. Compared to a standard production process the combination of the MacroMedia and the MicroMedia Invicta result in a 175 percent increase in productivity per line. Energy costs are cut by half for every ton of ink pro-

duced, which is translated into savings of 200 kg CO<sub>2</sub>e being pumped into the atmosphere. The climate change benefit is that a company producing 5,000 tons of ink, dyes, or chemical coatings each year will save the equivalent of the CO<sub>2</sub> capture of 40,000 trees. “We like to feel that the wet grinding process technology, as a business area in Bühler, is doing its bit and contributing to the overall sustainability targets that we are aiming to reach by 2025,” says Angela Zürrer, Product and Strategic Marketing Manager for Grinding and Dispersing at Bühler.

**Rich history**

Ink is a liquid paste containing pigments. Cyan, magenta, yellow, and black are the workhorse colors in the printing world. More sophisticated printers can have up to eight colors, including light cyan, orange, and grey. Each pigment has a rich history behind it. The earliest inks came from materials found in nature, including secretions of octopi, cuttlefish, squid, or tannin from tree bark and nuts. The most famous is purple, or in the printer's contemporary lexicon magenta. In antiquity it was made from marine snails and boiled for days. It was the color worn by Roman emperors due to its high production costs. Today the origins of pigments are more prosaic, based on chemistry and often closely guarded industrial secrets between commercial rivals. Pigments arrive at the ink manufacturer in powder form, to be added to liquid mediums comprised of water or solvents, binders, and other additives. It is during this wet grinding process that Bühler's unbeatable duo solutions take center stage.

According to Zürrer, the aim of the ink manufacturer is to make as fine and consistent an ink as possible from the powdered pigment. “The aim of the whole process is to make the pigments smaller in size and to nicely disperse them in the liquid to ensure high color strength and high gloss so that the food packaging looks nice and you feel a smooth surface when you touch it,” explains Zürrer.

Before Bühler introduced the unbeatable duo, the grinding of pigments was the job of the bead mill only. A bead mill is designed to grind particles down to a micro and nano scale by passing the material several times through a grinding chamber containing beads that are being agitated. The applied forces and size of the beads dictate the fineness of the final product as well as the energy required and the processing time. In the past this was a time-consuming and energy-intensive process as producers were limited in the bead sizes they could use because of varied pre-mix qualities.

The ability of the unbeatable duo to cut energy usage by half comes down to a simple law of physics. The smaller the bead you use in the final milling process, the less mass-specific energy is required to create a quality color dispersion and so the more sustainable the product.

#### A holistic approach

According to Zürrer, the secret of the new Bühler solution is to focus on improving the fine grinding process, and to adopt a more holistic view by taking the premixing step into consideration.

“This is why we call the combination of the two process units working together the unbeatable duo,” explains Zürrer. “The MicroMedia Invicta is at its



With the MicroMedia Invicta, Bühler made another major step towards more efficiency, productivity, and higher flow rates.



Small, but with a big impact, the MacroMedia ensures greater efficiency throughout the grinding process.

most efficient when all particles in the pre-mix are approximately the same size. But because you often get bigger agglomerates this is not always possible, so using the MacroMedia for preliminary grinding solves the problem, allowing the Invicta to operate at its full potential.” By having a higher quality pre-mix, it is possible to use smaller beads in the subsequent fine grinding step. The result is better bead activation, distribution and a higher flow that translates into more efficiency and productivity.

#### Shift in practices

Dr Frank Tabellion, Director Process Technology Grinding and Dispersing at Bühler, describes the fine grinding done by the MicroMedia Invicta as the heart of the production process. It is here, Tabellion points out, where most of the benefits arise, namely valuable increases in productivity, reductions in energy consumption, and consequently cuts in CO<sub>2</sub> emissions.

“This part of the process requires 80 percent of the energy demand and is also the most time-consuming step in the whole process and it has the largest impact on overall productivity and energy consumption,” explains Tabellion. “By reducing the bead size we can increase the number of beads in the grinding chamber, which increases the number of milling events and so it becomes a more efficient grinding process.”





Angela Zürrer, Product and Strategic  
Marketing Manager Grinding and Dispersing at Bühler



Dr Frank Tabellion, Director Product  
Management Grinding and Dispersing at Bühler

Energy savings leading to carbon emission reductions and cost savings are some of the major benefits of this approach. It also addresses another pressing issue impacting ink producers. In recent years printing ink manufacturers have been finding increasingly varied particle sizes in their pigments.

The change has happened over the past 20 years as production costs have been forced down through competition. A key part of pigment production is the drying step. By increasing the temperature and so speeding up the drying process, producers are able to reduce costs. “At higher temperatures, particles that have been generated in the chemical process start to form lumps and sometimes they even come together to create a larger crystal,” he says.

This is a constant challenge in the market. It is a challenge the Bühler pre-dispersing process is helping to resolve by ensuring all the material that goes into the fine grinding process is reduced to a constant and manageable size. “With the unbeatable duo, the fine grinding process is not really affected by these fluctuations in particle size because we are using an advanced pre-dispersing process. This is not really the case with other technologies,” Tabellion explains.

As with other Bühler solutions, digitalization is set to become part of the wet grinding story. The Grinding and Dispersing team is currently working with colleagues from the Bühler food divisions to jointly develop new digital services. “What we do have at the moment in this unbeatable duo is the ability to control the whole process and set parameters from one screen,” says Zürrer. “Through Bühler

**“WITH THE UNBEATABLE DUO,  
THE FINE GRINDING PROCESS  
IS NOT REALLY AFFECTED BY  
THESE FLUCTUATIONS IN PAR-  
TICLE SIZE BECAUSE WE ARE  
USING THE PREMIX PROCESS.”**

**FRANK TABELLION**  
Director Product Management  
Grinding and Dispersing at Bühler

Insights, machines are being connected to the Cloud facilitating the collection and analysis of data on production parameters to ultimately further increase efficiency and productivity. We can then benefit, for example, from data analytics and have access to predictive maintenance data for the machines.”

The direction of travel is clear. However, for the moment the industry is coming to terms with being able to prepare a consistent pre-mix quality for the fine grinding process: an idea that is benefiting manufacturers in terms of productivity, efficiency, and sustainability. “We believe this technology will shape the landscape for how modern inks and coatings are manufactured in the future,” says Tabellion.

A photograph of an industrial factory setting. In the foreground, there is a large, teal-colored machine, possibly a robotic arm or a conveyor system, with various cables and hoses attached. The background shows a complex network of pipes, structural beams, and other industrial equipment. The lighting is bright, with some areas in shadow.

*\_imagine*

# GEAR SHIFT *FOR THE* *CAR INDUSTRY*

TEXT: STUART SPEAR





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*Car manufacturers are at a watershed as they move further into the age of electric vehicles. With this change comes a shift in production methods, and Bühler is fully prepared for the new challenges.*

**CHANGE DRIVES INNOVATION.** The electro-mobility revolution has brought with it a radical rethink around car production methods. Both established and new car producers are looking to simplify their production methods and save costs by reducing the size of their factories by producing ever-larger components that require fewer robots to assemble them. The industry is even changing the materials they use to manufacture cars.

Car manufacturing traditionally involved stamping sheets of steel into the shapes needed. A typical car would be made up of hundreds of different steel parts that needed to be welded and fitted. In 1993, the car manufacturer Audi took a radical step when it introduced the Audi Space Frame concept for one of its luxury sedans. It was the starting point for a new manufacturing process. Instead of steel, Audi used aluminum and integrated casted structural parts created by using a process called high-pressure die casting. It involves molten aluminum being shot into a die or mold in milliseconds and then being solidified under high-pressure compression.

Between 2000 and 2010, a handful of luxury car manufacturers started to follow Audi's example and began using structural castings in their designs. While the parts were varied the volumes were low as early adopters still restricted their usage to luxury ranges. Over the following years, more manufacturers switched to die casting. One example is the production of the shock tower, an integral part of a car's body in white, the stage where the car frame has been joined together and is yet to be painted.

### Rapidly changing market demands

But it was increasing environmental standards requiring greater weight reduction in vehicles along with the desire to cut production costs that started to drive a more radical change in the market. A process once limited to a few luxury car lines was now catching the attention of car producers across all price ranges. Out of the 78 million light vehicles produced globally in 2020, 6 million involved structural castings in their manufacture.

It is still a small proportion of the market that includes aluminum die-cast parts in car bodies, but that figure is expected to grow to around 25 million by 2030. Michael Cinelli, Bühler's Product Manager for Die Casting, believes the auto industry is at a watershed. "We see enormous opportunities for die casting as newcomers are changing the market by opting for the advantages of the aluminum die-cast method. On one hand, there's the trend toward further implementation of structural components in many different car segments," he explains. "On the other hand, the new body-in-white-concept is a highly interesting development, resulting in growing demand for bigger die-casting solutions."

**"WE SEE ENORMOUS OPPORTUNITIES FOR DIE CASTING, AS NEWCOMERS ARE CHANGING THE MARKET BY OPTING FOR THE ADVANTAGES OF THE ALUMINUM DIE-CAST METHOD."**

**MICHAEL CINELLI**

Product Manager for Die Casting at Bühler

This market development led Bühler to expand its portfolio last year with the inclusion of the Carat 560, the Carat 610 and the yet-to-be-launched Carat 840, capable of a locking force of 84,000 kN (just over 8,500 tons). The locking force is the force used to keep the two halves of the die together. The greater the force, the larger the component that can be produced in one shot of aluminum under a certain pressure. These machines are big; the smallest of the three, the Carat 560, weighs about 400 tons, or the same as a Boeing 747-400.

Cinelli believes the move to larger machines has in the past been inhibited by what he describes as a "chicken and egg" situation. "Car designers did not think about large component sizes because the machines to make them were not available and we had no reason to build bigger machines because there were no components requiring such large machines," he explains.

Now that the market has changed, car manufacturers realize that to remain competitive they need to fundamentally rethink their production setup – with the die-casting process at the heart to increase flexibility and efficiency.



**INFO****ABOUT THE CARAT SERIES**

The Carat two-platen solution with minimum deflection and a high degree of dimensional accuracy has long proven its value to produce large and complex structural components. The unique Bühler shot control system, for real-time closed-loop control, enables consistent high-quality part production.

All the machines in the expanded Carat portfolio are delivered with the DataView control unit – which makes the control of the die-casting machine easier and more intuitive via its multi-touch screen. Additionally, every machine is equipped with our new energy frame concept with a clear and distinctive arrangement of energy couplings. The Carat series, which includes machine sizes from 10,500 to 84,000 kN (kilonewtons) also offers the option of servo drive technology.

It is the rise of electro-mobility that has proven to be the greatest market disruptor. New car manufacturers realized that going straight to die-cast production was more cost-effective when it comes to start-up costs. This is particularly true for newcomers that don't already have the stamping and assembly lines in place necessary for traditional sheet metal production.

Companies such as Tesla are also finding that larger machines, when producing a single large component, can result in doing away with costly welding and assembly processes. Fewer processes require a smaller factory footprint and overall lower investment to produce greater volumes. Tesla is currently using 6,000-ton die-casting machines to produce the rear underbody for its Model Y car in the US and in China, according to statements made by Tesla CEO Elon Musk in the 14th episode of the podcast "Third Row Tesla" released in April 2020.

This single piece casting combines 70 different stamping parts and reduces the number of robots required by 300 and the factory footprint by 30 percent. Larger machines are also capable of producing more components in one shot. Shock towers

are typically cast one or two at a time, taking around 70 seconds each. A die-casting machine large enough to produce four shock towers in one shot can significantly increase productivity and cut costs.

**A key component for a greener future**

Carbon emission reduction is central to the ethos of electric vehicles, which is why manufacturers are also looking to lower their production emissions. Primary aluminum production is very energy intensive, so companies are looking for ways to produce it using renewable energy sources. Manufacturers are turning to countries such as Dubai, where solar power is used, and Norway with its abundant hydro-electric resources, to produce aluminum.

All these fundamental changes offer unique opportunities. "The die-casting industry is at a cross-roads as more manufacturers adopt a new philosophy towards their production methods," Cinelli explains. "We believe current market forces are pushing the car industry towards die casting as an alternative to sheet metal design, and Bühler is absolutely ready to meet this new demand with our expanded Carat range."

# DID YOU KNOW...?



... that One Young World (OYW) is a **global forum for young leaders?**

Its mission is to create a better world with more responsible and effective leadership by connecting the world's most impactful young leaders.

... that **Bühler has sent 40 delegates** from 2016 to 2019 to the OYW summit?

The 2020 flagship summit was cancelled as an essential response to curb the spread of Covid-19, but the 2021 summit took place in July in Munich and 10 Bühler delegates joined.

... that Bühler has been **sending a delegation of its young leaders** to this summit since 2016?

Bühler's Generation B (GenB) initiative was brought into being by the first dele-



gates shortly after their return from the annual summit. GenB now has 800 members and 75 ambassadors in 25 countries.

... that OYW holds an annual **flagship summit, bringing together the world's future leaders** to discuss and exchange ideas on today's most pressing topics, and work to accelerate social impact?

... that in 2019, Bühler's delegates joined the summit **not just as participants, but also as speakers?**

They actively promoted Bühler's Generation B movement. And Ian Roberts, CTO of Bühler, announced a partnership with OYW and Mass Challenge that same year.



... that Peter Bakker, President and CEO of the World



Business Council for Sustainable Development said GenB is **one of the most innovative culture change programs** he has ever seen?

... that Bühler's GenB has **organized and hosted two OYW Switzerland caucuses?**

The first was held in 2019 and the second in June 2021. This year's event was hybrid with delegates joining virtually and in person at the CUBIC in Uzwil and in Arosa, Grisons.

... that Bühler CEO Stefan Scheiber announced that GenB will again **host a OYW Caucus in Switzerland in June 2022?**

The participants will share what they have achieved since the June 2021 caucus to expand the GenB network and its impact with the help of Bühler customers and its partners.



... that GenB has held **experience-sharing sessions with over 10 global companies** that want to learn what GenB does and how they do it?

This includes Barilla, Nestlé, Barry Callebaut, Ardent Mills, and more.

Sources: One Young World, Bühler Group.

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# TOGETHER, GENERATIONS MOVE MOUNTAINS



Ian Roberts, CTO Bühler Group at the OYW Switzerland Caucus 2021 in Arosa.

VIDEO



OYW21 CAUCUS

**“WE ARE THE MOST PRIVILEGED GENERATION EVER.** We have the unique opportunity to tackle climate change, restore nature and biodiversity, and improve living quality. We will not stop climate change, but we can limit it, and with our actions support the planet to reach a new sustainable equilibrium.”

These words of Professor Tom Crowther, delivered on a mountaintop in Arosa to 50 young leaders, were inspiring, optimistic, and most importantly, empowering. They epitomized the spirit of the One Young World Switzerland Caucus that took place at Bühler and in Arosa in June. Organized by Generation B, in partnership with One Young World (OYW) and Arosa Tourism, the Caucus brought together 250 young leaders from 150 companies, academia, and NGOs in a hybrid session at the CUBIC in Uzwil and then took 50 selected leaders to build action plans in the beautiful mountain resort of Arosa.

Outstanding contributions from partners such as Be That Girl, Restor, MassChallenge Switzerland, and OYW covered topics such as empowering young women, reforestation and biodiversity, sustainable tourism, creating grassroots movements across companies that drive sustainability agendas, and the need to do this in partnership.

In Arosa, three work groups ensconced themselves in different mountain huts, received inputs from experts and practitioners, and tackled three topics: driving change with grassroots movements across companies, creating the most sustainable tourism destination, and developing sustainable startups. Each team reported their findings and actions and these will be tracked through to the next OYW Switzerland Caucus in 2022.

Although we expected the energy and passion shown by the participants, this was accompanied by a resolute determination to use business to drive good, address global issues, and the requisite appetite for action and hard work. This has so impressed us at Bühler, that next year OYW Switzerland will take place in combination with the Bühler Networking Days at Uzwil in June.

Now this does not mean that we will not show great innovations, services and technologies, have industry-relevant content and speakers, networking opportunities with your peers, and deep dives into critical topics, such as digital connectivity, circular economy, and sustainable land use to name a few. In fact, we believe that it will be the most impactful event we have convened. But, in addition to these industry critical topics, we will add a day to partner with OYW Switzerland and engage on talent development, entrepreneurship, leadership, education, and sustainability.

We can all learn so much from this generation of current and future young leaders, and equally, they can learn from our experience and skills. This combination of generations can unlock extraordinary potential. One aspect that most impressed me about the event was how natural it was for Generation B to partner across ecosystems, to engage with influential NGOs, academics, to find like-minded individuals to come together and collaborate. A little note to those who question the work ethic of our young generation: This was all in their own time and voluntary. We are excited about the Bühler Networking Days in 2022 and are delighted to partner with OYW Switzerland during the event.

