



# Annual Review 2022

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## CEO Review 2022

**2022 has been another unusual and challenging year but the global Kemira team has remained steadfast in navigating global challenges and helping our customers do the same. Financially it was a record-strong year with revenue reaching an all-time high of almost EUR 3.6 billion. This increase was driven by higher sales prices, particularly in energy-intensive pulp, bleaching chemicals, and caustic soda. The operative EBITDA reached a record high of EUR 572 million in 2022. During the year our team worked very hard to mitigate the impacts of unprecedented inflationary pressures. The operative EBITDA margin improved to 16.0%, which is within our financial target range of 15-18%.**

Kemira is now a fundamentally stronger company. Our balance sheet is strong and the net debt / EBITDA ratio declined to 1.3 at the end of 2022. Our strong position enables us to look for organic and inorganic growth opportunities as sustainable profitable growth continues to be our strategic focus area. In 2023, our new investments in Uruguay will be completed and we will continue to progress our biobased strategy to reach our goal of EUR 500 million in biobased revenue by 2030.

We exited the Russian market after discontinuing all deliveries to Russia and Belarus at the beginning of March. Russia

was a relatively small market for us and accounted for roughly 3% of Kemira's total revenue in 2021. Several Covid lockdowns and then the rapid and sudden removal of all Covid restrictions in China have also caused difficulties during 2022. Kemira has been able to keep all our Chinese manufacturing sites running and the well-being of our employees has been continuously monitored.

A major topic for the markets and companies especially in EMEA was energy and energy availability and price inflation. Kemira is a significant user of energy with annual energy purchases globally amounting to around EUR 300 million in 2022 of which 68% was





## We are starting 2023 from a very strong position. I am very proud of our global Kemira team and what we have achieved together in 2022.

carbon-free. Most of Kemira's energy purchases are electricity, but some of our production facilities use natural gas in Europe. Kemira prepared for various scenarios should energy, particularly gas, availability be disrupted in Europe. Kemira was and is also exposed to indirect impacts via Kemira's customers and suppliers. Particularly high energy prices or disruptions in energy availability could reduce or temporarily stop production at Kemira's customers and/or suppliers, which could affect Kemira's end-market demand or supply chain. In 2022 we didn't experience major disruptions in this area.

We have focused on executing our sustainable growth strategy on many fronts. We launched a new Growth Accelerator unit within Kemira to accelerate the commercialization of new biomaterials in our current markets and create business opportunities in adjacent markets. The build-up of this new organization is ongoing and it is expected to be operational in Q1 2023. During Q2 2022, we also announced a multi-year extension to our partnership with Danimer Scientific to commercialize fully biobased barrier coatings.

In June, we committed to the Science Based Targets Initiative (SBTi) and set a new ambitious climate target. We commit to

cutting emissions from our operations (Scope 1 and Scope 2 emissions) by 50% by 2030 from a 2018 baseline. This target is in line with limiting global warming to 1.5°C and it will be validated by the SBTi. Our ambition is to be carbon neutral by 2045 for Scope 1 and Scope 2 emissions. We are currently working on developing a quantified near-term Scope 3 target within the timeframe set by the SBTi framework.

Kemira is a safety-first company. Safe and responsible operations as well as safe production and use of our products throughout their lifecycle is a priority for us. Our most important objective is to make sure every one of us, including our contractors and other partners, can return home safely, every day. In 2022 we worked systematically to reinforce a "safety first" culture where people actively promote safety, recognize and correct unsafe behaviors, complied with safe working practices, and have accountability at all levels of the organization. We saw our efforts pay off during the second half of the year when the number of incidents significantly declined.

Our people, the global Kemira team, are at the center of our success and progress. I'm happy to note that our employee engagement remains consistently high despite the

challenging environment in which we have been operating. In 2023 we will be deepening our internal engagement in the areas of well-being and diversity & inclusion. Diversity is one of the greatest contributors to Kemira's success and we believe that solving tomorrow's challenges is only possible when we bring together our diverse knowledge, experience, and passion for what we do.

We are starting 2023 from a very strong position. I am very proud of our global Kemira team and what we have achieved together in 2022. Our efforts have been truly appreciated by our customers who once more have given us higher satisfaction scores than ever before.

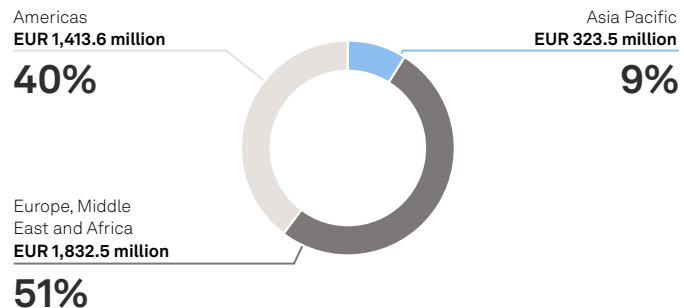
I want to also warmly thank our customers, suppliers, and other stakeholders for their continued trust in us. I am convinced that what we have learned in 2022 will help us to build a better and more sustainable future together.

**Jari Rosendal**

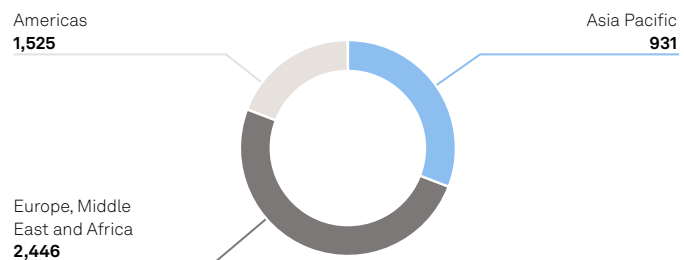
President and CEO

## Key figures 2022

### KEY FIGURES EUR, REVENUE BY REGION %



### EMPLOYEES BY REGION



62 manufacturing sites

Operating in 36 countries

Shipping to 110 countries

Revenue, EUR  
**3.6**  
billion

Operative EBITDA, EUR  
**572**  
million

Operative EBITDA margin  
**16%**

Earnings per share, diluted, EUR  
**1.50**

Total employees  
**4,902**

## Chemistry with a purpose. Better every day.

**Our purpose highlights our commitment to constant improvement and our goal of a better every day for people, business and the environment. Our employees, customers and the society are central when our chemistry is applied in a reliable, responsible and safe way.**

Our success is built on a unique combination of more than 100 years of chemistry expertise, high quality product portfolio, advanced digital technologies for process optimization and transparency, prime service reliability and delivery capabilities. We develop and apply chemistry to optimize water management and the ways natural resources are used and recycled. We advance people's everyday health and safety and constantly improve our customers' processes – enabling their sustainable business.

### **PULP & PAPER**

The Pulp & Paper segment combines best-in-class application expertise, latest technologies for advanced process management and a complete chemistry portfolio to serve our customers in the

papermaking industry across different grades from pulp to board, tissue, specialty papers as well as graphical and printing papers.

### **INDUSTRY & WATER**

The Industry & Water business segment enables water intensive industries and municipal water treatment operators improve their process and resource efficiency. In oil and gas applications we enable reduced water and energy use for more efficient well management and improve oil sands tailings treatment.

Our focus on water intensive industries continues and we are continuously evaluating new opportunities for growth within this sector.

### **SAMPO LAHTINEN: GROWTH ACCELERATOR TO SPEED UP GROWTH AMBITIONS**

In June Kemira announced the formation of a new Growth Accelerator unit to drive long-term growth for selected strategic initiatives, starting in 2023 and supporting both segments. The unit's main objectives are to accelerate commercialization of new and unique biomaterials into Kemira's current markets and to create business opportunities in new adjacent markets for both new and existing Kemira products. Kemira's target is to grow the revenue from biobased products to more than EUR 500 million by 2030.

In the chemical industry, commercialization of new materials typically takes time and resilience, and the requirement for persistent dedication is one of the reasons why the unit is needed. We aim to provide customers with more visibility to the new biomaterial products in our pipeline. Moreover, we will provide more opportunities for our customers to become early adopters for such products, and opportunities to co-develop new products in their markets.



"We now have sufficient focus, dedication and mandate to accelerate commercialization of our transformational products and expansion to new markets. Kemira already reached EUR 219 million biobased revenue in 2021."

### **Sampo Lahtinen**

Senior Vice President, Growth Accelerator, Kemira

## How we create value

### KEY INPUTS

#### Our people

- Competence and skills of 4,902 employees representing 62 nationalities

#### Global operations

- 62 manufacturing sites
- 110 ship-to countries

#### Financials

- Equity: EUR 1,684.6 million
- Interest bearing liabilities EUR 1,021.8 million
- Cash: EUR 250.6 million

#### Purchased materials

- 2.5 million tons, of which 38% recycled, industrial by-products and 3% renewable raw materials

#### Energy, Water

- Total energy purchased 4,500 GWh
- Water consumption 6.2 million m<sup>3</sup>

#### Partnering with stakeholders

- Key relationships with customers, suppliers, contractors, distributors and agents, industrial partners for secondary raw materials

#### Intellectual property

- Innovations: 2,101 granted patents
- Brand and reputation

### OUR ACTIVITIES

#### Sustainable products and solutions

- Customers' product quality and process efficiency improvements
- 53% of our products improve customers' resource efficiency
- Safe production and use of our products

#### Responsible operations and supply chain

- Lowering costs and environmental impacts of our operations
- Workplace safety
- Sustainability in sourcing and supply chain management

#### Innovations

- Dedicated forward looking R&D
- Digitalization and service design, innovative business models
- 24 new product and concept launches

#### Purpose-driven inclusive culture

- Purposeful work, recognition and development opportunities
- Guiding principles and systems (Code of Conduct, Leadership principles)
- Commitment to UN Global Compact via advancing the SDG agenda

### KEY OUTPUTS

#### Economic value

- Revenue from customers EUR 3,569.6 million
- Operating profit EUR 347.6 million

#### Products and services

- Revenue from biobased/renewable products over EUR 219 million
- Technical expertise, applications support, digital services and total chemistry management
- Process control and monitoring

#### Emissions and waste

- Scope 1 + Scope 2 GHG emissions 816 thousand tons CO<sub>2</sub> eq., Scope 3 emissions 3,609 thousand tons CO<sub>2</sub> eq.
- Total waste 107,700 tons

### KEY IMPACTS

#### Environment

- Clean safe water
- Renewable biobased economy
- Water and energy efficient industry

#### Stakeholders, society

- Customer satisfaction: NPS 53
- Collaboration with key business partners development and innovation partners
- Recognition for our contribution to better societies and environment by external parties eg. CDP, EcoVadis, sustainalytics, ISS ESG, MSCI, S&P Global
- Job opportunities, partnerships for local communities
- Employee engagement, competencies, strong leadership for future of work
- Collaboration with universities and research institutions

#### Economic value distribution

- Profit
- Wages and benefits EUR 384 million
- Income taxes paid EUR 33 million
- EUR 95.9 million paid in dividends to approx. 50,000 shareholders

## Delivering customer value

**Our focus on security of supply and good customer experience have been rewarded with record high customer satisfaction.**

The past years have brought many challenges to businesses and the economy overall. Our global supply teams in particular have faced unprecedented turmoil. A global pandemic, raw material shortages and logistical challenges followed by the war in Ukraine have put the agility, speed and resilience of global supply chains to the test.

Despite this, we have improved our customer satisfaction again in 2022, and have seen a significant increase in our Net Promoter Score (NPS) occurring from 2020 onwards – in other words, during extraordinarily high

raw material and energy prices, health and safety concerns, and availability disruptions on several fronts.

Our NPS score is currently at +53. According to customer feedback, 72% of surveyed customers state that there has been no change to the supply of products and service to them during the pandemic. This “business as usual” assessment during an unprecedented period of uncertainty is a source of pride for the Kemira team, as we make every effort to keep our promises to the customers.

### THIERRY BLOMET: SOLVING CHALLENGES IN TURBULENT TIMES

We've had to operate in a volatile business environment and take into account unpredictable circumstances across our value chain. Our strategic actions over the years to ensure business continuity have provided a leverage. The diversification of supply has reduced dependencies for instance, and we have built long lasting partnerships based on trust. This has only been possible with the dedication of Kemira's seasoned sourcing, procurement, customer service and other professionals, who tend to work behind the scenes to fulfill customer orders, coordinate with manufacturing to secure supply, arrange transportation of products and to navigate and negotiate for Kemira to remain competitive. Thank you to each and every valuable member of the Kemira team.



"We focus on world-class supply chain, a global manufacturing network with local presence and strong backward integration to key raw materials, as well as digitalizing our processes to ensure speed and transparency. I want to congratulate the team who has worked tirelessly to come up with solutions and solve issues. Thanks to your expertise we have been able to ensure operational agility and delivery reliability in a volatile environment."

**Thierry Blomet**

Senior Vice President, Sourcing, Kemira

## PULP &amp; PAPER

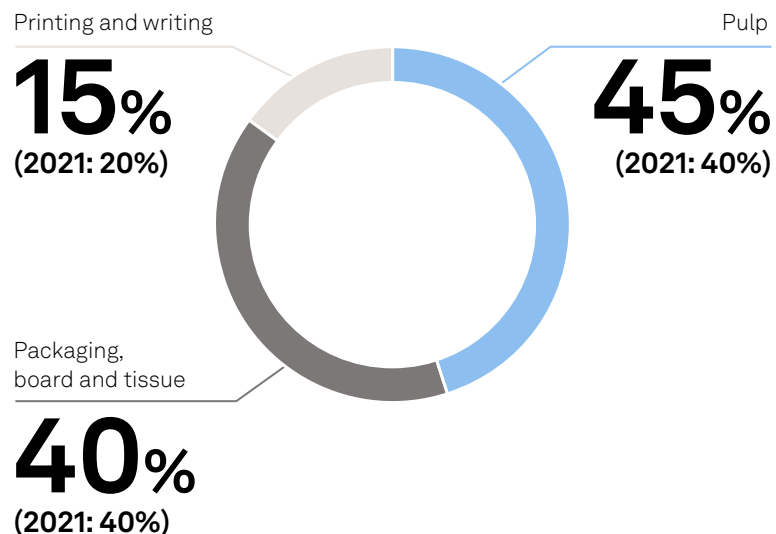
# Customer-driven sustainability trends enhance growth

Paper and board are sustainable natural products derived from renewable and recyclable raw materials. Wood-based fiber can be utilized in a variety of applications and end-uses, for example to reduce the use of plastics in food packaging applications. And its utilization is growing due to the demand of existing and also novel applications, as industry keeps innovating to find new solutions in fiber-based economy, such as textiles.



We collaborate with industry-leading companies to address sustainability drivers and other global megatrends, such as urbanization and e-commerce, and evolving needs and opportunities. With a complete chemistry portfolio, our application expertise, and digital technologies for advanced process control, we help our customers succeed – enabling efficient, sustainable processes and ensuring end-product quality and safety.

## REVENUE BY PULP & PAPER CUSTOMER TYPE



## HIGHLIGHTS 2022



### Commercializing biobased barriers – partnership expansion with Danimer Scientific

Kemira is developing new, biobased and biodegradable aqueous dispersion barrier solutions for paper and board products in collaboration with Danimer Scientific. In May, we announced a multi-year license and supply agreement to commercialize barrier coatings based on Danimer’s Nodax™ PHA\* technology. The fully biobased barrier coatings offer excellent oil, grease, and water barrier properties, are safe to use in direct food contact, and have favorable end-of-life attributes, allowing full recyclability and compostability.

### Digital services for data-driven process and chemistry management

Kemira Pulp & Paper established a new dedicated service organization to accelerate growth in our services offering. With our expert and digital services, we help our customers optimize their production, increase process efficiency and productivity, and save on energy, water, and raw materials. KemConnect™ Harmonizer, a digital service combining automated machine learning and chemistry expertise, creates unique visibility and predictability in the papermaking process. The service, offered in collaboration with SimAnalytics, has revealed previously hidden opportunities for improvement in customer projects.

\*Polyhydroxyalkanoate

## Our chemical expertise benefits four main customer applications



### **PULP**

Meeting the growing fiber demand in, for example packaging and tissue, and new end-use applications such as wood-based textile fiber require expertise in pulp production. Kemira is the key supplier for fiber production, providing targeted chemistry and application know-how for efficient and profitable pulping and bleaching operations. Our extensive R&D and application knowledge throughout the entire papermaking process helps our customers with pulp quality and environmental performance.

### **BOARD**

High quality packaging board both protects a wide variety of products and promotes brands in the best possible way. This requires properties such as strength and stiffness, lightest possible weight as well as superb printing and converting of the package. With liquid packaging and food service grades, strict standards for hygiene and cleanliness must be met to ensure consumer safety. We offer industry-leading chemistry expertise to help board manufacturers achieve all these qualities.

### **TISSUE**

Strength, softness, and absorbency are the required properties for many tissue products. We analyze customers' processes to introduce the desired functionality into the sheet with the help of chemistry. We also help reduce costs for raw materials and energy, and help with the hygiene, cleanliness, and safety of operations.

### **PAPER**

Great opportunities exist in the paper business to use chemistry for competitive advantage. On the cost side, this includes fiber substitution where strength aids and binders allow the use of cheaper fibers and fillers. In operations, cleaner machine water systems can increase uptime and sellable tons. And new binder, coating, and strength chemistries support future development and meet the specific needs of new paper applications.



## CASE

# Functionality for fiber-based food packaging

Paper and board require functional properties that enable the efficient use of the renewable and recyclable raw material in plastic replacement in demanding packaging applications. One such critical feature is the fiber-based material's resistance against liquid, i.e. hydrophobation.

Based on Kemira's own proprietary technology, we have developed new biobased surface sizing products to help paper and board producers meet the demand for sustainable and safe packaging materials. The portfolio of Kemira FennoSize™ surface sizing products provides high-performance chemistries that have a broad product safety and regulatory profile and comply for instance with the strictest food contact requirements, to ensure consumer safety. FennoSize™ surface sizing agents are also fully recyclable to enable circularity and the efficient reuse of valuable fiber raw material.

For the paper and board manufacturer, the products provide more opportunities to develop high-value products and reach a better sizing performance cost-efficiently in the demanding papermaking process conditions.

INDUSTRY & WATER

# Accelerating sustainable growth in water-intensive industries

We believe in clean water and sanitation for all. Yet ensuring everyone has access to this most precious of resources remains one of our society's greatest challenges, due to climate change, population growth, and emerging contaminants, like microplastics. That's why we continue to develop new concepts for all stages of the water treatment process, enabling customers like municipal utilities to increase their capacity, sustainability and resilience.

Water treatment is an important part of all our customer industries, as raw water, process water and wastewater need to be appropriately managed, in the most cost-effective way. We help water-intensive industries from food production to the energy industry or metals and mining with process and resource efficiency improvements, contributing to the end-product quality. In oil and gas applications, our chemistries enable improved yield from existing reserves and reduced water and energy use.

Sludge treatment offers opportunities for further efficiencies and for creating value from waste.

Our customers are diverse, yet they look for many of the same qualities from our products: safety, resource efficiency and solutions that are future proof for regulatory requirements driven by sustainability. The digital services we offer today are built on our over 100 years of expertise in chemical products and application know-how. We have developed unique, real-time monitoring and control technologies for chemistry applications to support performance optimization, fast troubleshooting, and continuous improvement.

## INDUSTRY & WATER APPLICATION SPLIT

Other

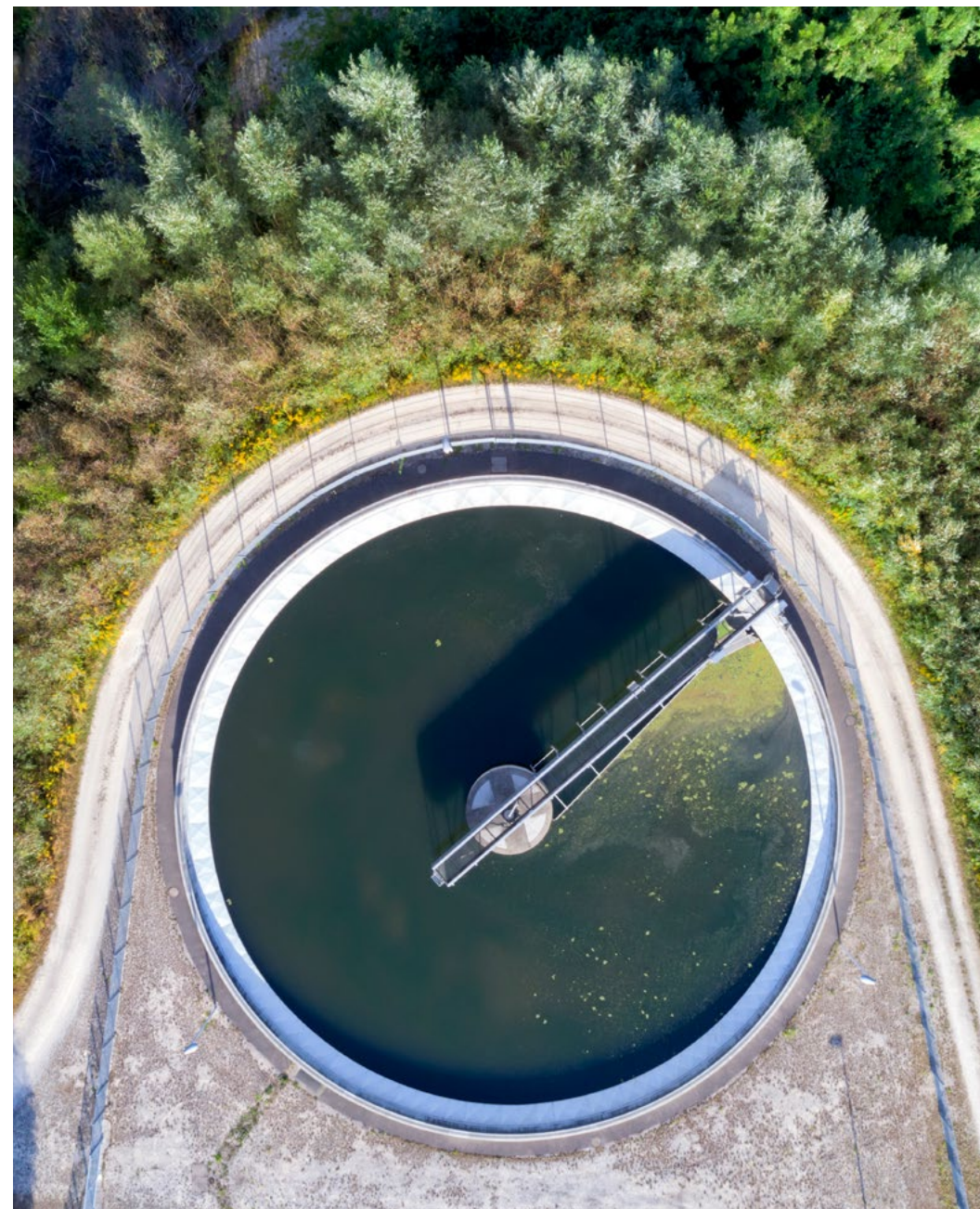
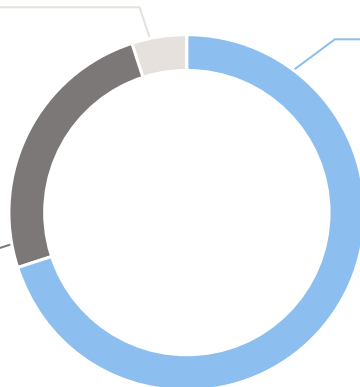
**5%**  
(2021: 10%)

Water treatment

**70%**  
(2021: 70%)

Oil & Gas

**25%**  
(2021: 20%)



## Solutions for municipalities and water-intensive industries



### WATER TREATMENT

Through our work with cities' and municipalities' water treatment plants, we help ensure citizens have access to the clean, safe, and affordable drinking water they need for a healthy life. Our chemistries also help in treating the discharged wastewater in an efficient and responsible way – ensuring it meets environmental permit standards.



### INDUSTRIAL WATER

Each process water system is different and requires customized products, depending on the water quality, branch of industry and process parameters. With the right technologies, water can be reused through several cycles. We help customers optimize the total cost of process, with lower energy and water consumption, and keep equipment running reliably with less maintenance required.



### OIL & GAS

Oil and gas producers are searching for ways to improve production efficiency. Our solutions for stimulation and chemical EOR are designed to help operators produce more with less resources. In oil sands, Kemira's water treatment expertise and know-how from oil and gas customers creates a unique market position. We add value to customers' mandatory tailings treatment processes, accelerating the reclamation process.



## CASE

# Data-driven chemical treatment leads to more sustainable operations

Achieving considerable process improvements in wastewater treatment requires consistent and accurate monitoring. Digitally enhanced chemical treatment helped the Dutch city of Arnhem reduce their carbon footprint, while optimizing the plant's operational performance.

Arnhem Zuid is one of 31 wastewater treatment plants allocated to the Water Board of Rivierenland region in the Netherlands. The plant has a designed capacity of 206,000 population equivalent (p.e.). The actual load in 2021 was 327,000 p.e. and a hydraulic throughput of 6,400 m<sup>3</sup>/hour. In the beginning of 2022, Kemira's digital solution for automated chemical dosing, Kemira KemConnect™ SD, was installed in combination with the newly developed polymer Kemira Superfloc® SD-7083, to reinforce the improved chemical treatment process.

Read more about the benefits attained in Arnhem Zuid in [kemira.com](https://www.kemira.com).

## Responsible actions and sustainable growth

Sustainability is the key driver of our strategy and an enabler of our long-term success. Purposeful chemistry in combination with digitalization will help find solutions for global challenges of the future, such as solving climate change and protecting societies from water scarcity. Besides grasping new opportunities, we will continue to be the responsible partner for our stakeholders.





The global shared ambition to build a sustainable world is articulated in the UN Sustainable Development Goals (SDGs) and we have decided to focus on four SDGs where Kemira can make the biggest impact; 6, 8, 12 and 13. We also prioritize five key sustainability themes as safety, people, water, circularity and climate that are most material to us and where we can make the biggest positive contribution, taking all aspects of sustainability; economical, social and environmental into consideration.

## SUSTAINABILITY HIGHLIGHTS 2022

### New ambitious climate target

We have made our commitment to the Science Based Targets initiative (SBTi) in line with the Paris Agreement ambition of staying on the 1.5°C trajectory. Kemira set a new ambitious climate target for Scope 1 and 2 and will establish a quantitative Scope 3 target in the near future.

### Speed for biobased success

Sustainable product development, encouraged by strong customer mandate, is speeding up: we accelerate the growth of new offering and applications driven by renewable chemistry and digital solutions, including forming strategic partnerships with multiple suppliers, contributing overall to reaching our EUR 500 million biobased revenue target. The lead time to markets in the chemical industry is long and thus we formed a separate Growth Accelerator unit to speed up our penetration to both old and new markets with more sustainable solutions offerings.

### Concrete action to boost sustainability programs

Sustainability governance was strengthened through a dedicated steering team, four dedicated sustainability programs highlighting our most important focus areas, and KPIs and targets to steer our development and incentivize our leadership. All these actions help us take the strategic sustainability statements into concrete action. Our sustainability programs focus on; Climate Action, Nature Stewardship, building a Positive Impact Portfolio, promoting Diversity & Inclusion, accelerating our Biobased Strategy and never compromising on safety.

## Our targets

Measuring the most material impacts leads to more sustainability-driven actions. We have set long-term targets that describe our ambition and we measure these with relevant KPIs. We have set six targets for our five focus areas.



### PEOPLE

Our employees drive our sustainability transformation. A diverse and inclusive culture enables us all to bring our best selves to work every day.

**Target:**

Reach top 10% cross industry norm for Diversity & Inclusion by 2025.



### WATER

We believe in clean water and sanitation for all. Our actions set the example for world class water management.

**Target:**

Improve our water management to Leadership level based on CDP Water Security scoring methodology by the end of 2025.



### CIRCULARITY

We set sustainability at the center of every design. Our sustainable chemistry and digital solutions accelerate the circular- and bio-economies.

**Targets:**

Reduce disposed production waste intensity by 15% by 2030.

Biobased products >500 million EUR revenue by 2030.



### CLIMATE

We cut our climate impact throughout our value chain. Clean energy and processes will support our ambition to go carbon neutral by 2045.

**Target:**

Scope 1 & 2 emissions -50% by 2030.

### SAFETY

We prove that a safe business is a sustainable business. Safety of people, products and processes is the foundation of everything we do.

**Target:** TRIF 1.5 by 2025 and 1.1 by 2030.

# Our Commitment and Ratings

We are committed to the United Nations Global Compact 10 principles, to respect and promote human rights, implement decent work practices, reduce our environmental impact, and combat corruption. Furthermore, we work by the United Nations Guiding Principles which require companies to conduct due diligence to protect and respect human rights. We are also long-time reporters of the Responsible Care®, a voluntary commitment by the global chemical industry to drive continuous improvement and achieve excellence in environmental, health and safety and security performance. As of 2022, we are committed to the Science Based Targets initiative, aligning our climate action with the best practices rooted in science. We also joined the Renewable Carbon Initiative, which demonstrates our commitment to accelerate the industry shift

from fossil carbon to renewable carbon and raw materials.

## **WE AIM FOR THE LEADERSHIP LEVEL IN CDP WATER SECURITY**

Disclosure via CDP increases transparency towards the investor community and value chain partners. In 2022, Kemira received an improved B score in CDP Climate rankings. Kemira has been reporting the CDP Climate since 2010 and has been scored since 2012. We are committed to improving our management systems and increasing measures to mitigate climate change. Kemira received a B score in the CDP Water Security 2022 rankings. This is the second year that we received a scoring. Water Security reporting is of great importance to us since we have publicly committed to reach leadership level in this scoring by the end of 2025.

## **ECOVADIS PLATINUM RATING PLACES KEMIRA AMONG THE TOP 1% OF COMPANIES IN THE WORLD**



Kemira was awarded the Platinum rating by EcoVadis for the second year in a row. An improved score of 78 out of 100 (73/100 in 2021) placed Kemira among the top 1% of companies in the world. This shows our commitment to our value chain partners to keep sustainability high on the agenda and set the example for responsible corporate practices.

## **KEMIRA RATINGS ARE ABOVE OR EQUAL TO THE CHEMICAL INDUSTRY AVERAGES**



## KEMIRA'S SUSTAINABILITY PERFORMANCE KEY FIGURES

**68%**

of global energy use is carbon free

**41%**

of used raw materials are renewable or recycled

**53%**

of products improve customer resource efficiency

**21 Bm<sup>3</sup>**

of water treated with the help of Kemira chemistry, which is comparable to the annual water consumption of over 370 million people



## RASMUS PINOMAA: TRANSFORMING SUSTAINABLY WITH CHEMISTRY

We know that greenhouse gases in the atmosphere cause climate change. The misplaced molecules like carbon dioxide cause harm to our environment. What if we could utilize those molecules, and create products out of those? With chemistry, we can help reduce the amount of misplaced molecules, and convert them into value.

In Kemira we apply our chemistry so that our customers can improve their use of resources. We want to do it better every day. With the help of our chemistry, customers can reduce their need of energy and water and cut their waste and emissions. They can use their molecules more efficiently and create more value. Besides increasing customers resource efficiency, we also provide clean water solutions for them. With chemistry and digitality you can truly make

a difference, whether it's tackling climate change or preserving the water cycle.

Our sustainability journey is well on its way. We use large amounts of circular raw materials and zero carbon energy, for example our coagulants used in water purification are mainly manufactured from other industries' waste. But we don't want to stop there.

This year we committed to the Science Based Targets initiative to stay aligned with the best climate science and on a trajectory to limit the global warming to 1.5 degrees. We also joined the Renewable Carbon Initiative, which demonstrates our commitment to accelerate the industry shift from fossil to renewable materials.

We still have a long journey ahead of us, but we are on track to execute on our sustainability transformation.



"Our sustainability journey is well on its way. We use large amounts of circular raw materials and zero carbon energy."

**Rasmus Pinomaa**

Director, Sustainability, Kemira

## Safety

**At Kemira, safety is our highest priority. We ensure safe, responsible operations as well as safe production and use of our products throughout their lifecycle.**

Safety is a collaborative effort that involves everyone. Our business requires us to operate our manufacturing sites safely, transport high quality products to customers on time and without incidents, ensure our customers understand how to handle our products and finally, that the end consumer product is safe to use.

If rigorous requirements are not met, there is potential to harm people, processes and the environment. We keep close track of metrics related to people safety, process safety, transportation safety, chemical safety and environmental safety. Our industry is also highly regulated and we must maintain compliance with local, national and regional laws.

Target:

**TRIF\*: 1.5**

by 2025 and  
1.1 by 2030

\*Total recordable injury frequency per million hours, Kemira + contractors, year-to-date.

### ANNE HELENIUS-HEIR: SAFETY IS PART OF OUR DNA

Working with chemistry carries a great responsibility. Safe, sustainable solutions are a shared goal and safety must be on our shared agenda. Safety culture is more than personal protective equipment and handling chemicals properly. Safety is a mindset. Kemira is committed to safeguarding the health and safety of our employees and contractors. We are building a culture that instills safety through learning programs, focused on competencies like critical health and safety standards, and best practices for manufacturing operations. During the year we ran global safety campaigns with local events, successfully engaging employees and promoting the importance to stop and think with focus on safe behaviors and the impact of daily decisions on safety.



"Safety is a top priority and integral part of our company culture. We work systematically to raise awareness of each and everyone's role in safety. It is all about mindset and behavior: stop, think, act."

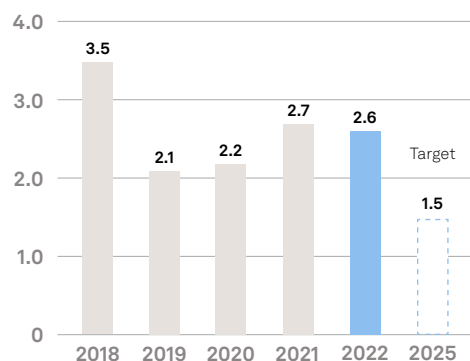
**Anne Helenius-Heir**

Vice President, EHSQ, Kemira

We continue to focus on improving our safety performance.

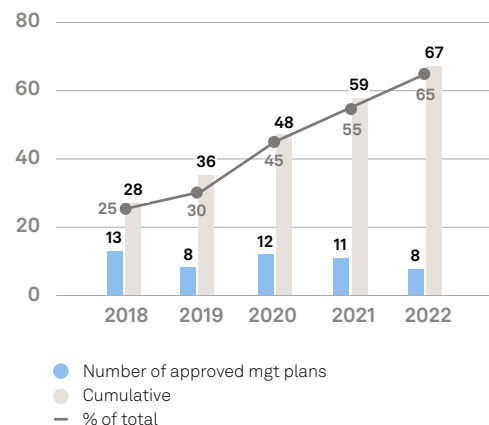
- Total number of TRIs in 2022 was 36 and TRIF was 2.6, covering both our own employees' and contractors' incidents.
- Number of reported safety observations 20,042 and Behavioral Based Safety (BBS) surveys 15,674 with 325,000 individual BBS observations.
- In our employee survey 86 percent of employees concur that 'Safety is a top priority' which is rated a point above manufacturing benchmark (October MyVoice Survey).
- Management plans for substances of concern have been done for 8 substances during 2022 and in total 67 approved plans are now available. Eight SVHC (Substances of Very High Concern) substances have been removed from portfolio during the process has been in place.

## OUR SAFETY PERFORMANCE (TRIF)



TRIF: Total Recordable Injury Frequency per million hours

## NUMBER OF PRIORITY SUBSTANCES HAVING APPROVED MANAGEMENT PLAN



Kemira's Priority Substance List includes substances found in Kemira's portfolio either as raw materials or final products in a concentration >0.1%. It includes listed substances in SVHC, REACH annex XVII, CoRAP, California Proposition 65, SIN, OSPAR, ECHA and EPA Endocrine disruptors, TSCA 2014 work plan and Conflict mineral lists examine options for managing these specific risks, and formulate action plans for the preferred options. These options to mitigate risks may include (e.g. substitution, phase-out or limiting exposure).

## HIGHLIGHTED ACHIEVEMENTS IN 2022

- Safety Performance: The safety target 2022 TRIF 1.9 was not reached. We need to continue systematic safety work together with our all stakeholders.
- Contractor Safety: New global contractor onboarding and prequalification process was established and contractor management standard was updated.
- Competence Management: We undertook a training program focused on two major elements of process safety, contractor management and permit to work. In addition, an EHSQ Learning Path was piloted for Field Work personnel in the Americas, covering all critical EHSQ Standards.
- We developed Behavioral Based Safety (BBS) program, which is the key to improve our ways of working and to achieve our future challenging safety targets.
- Kemira EU safety data sheets have been updated to be compliant with (EU) 2020/878 Annex II of REACH regulation.



## THE NEXT BIG THING IN PROGRESS

- Overall roll-out of refreshed BBS program with analytics and support.
- Increasing safety awareness with focused safety trainings.
- Evaluation of EHSQ criticality for existing contractors and setting of organizational controls based on the evaluation.
- Implementing of expected changes due to revisions on CLP, REACH and food contact materials regulations in EU.

## CASE

### Choose safety every day

To instill safety into our culture, we provide learning programs that focus on competencies such as critical health and safety standards and best practices for all our employees. We also pay attention to contractor safety through global harmonization of our contractor qualification and work execution processes.

Despite this we unfortunately saw a negative trend in our safety performance, which is why we increased our focus to reinforce a culture where all employees actively promote safety by recognizing and correcting unsafe behaviors. We put in a great deal of effort over the last year to encourage active dialogue and allow for personal reflection. Engagement through the whole organization has been the key.

In 2022, all manufacturing sites stopped work and carried out a Safety Stand Down, as mandated by Kemira's Top Management. They all took the opportunity to discuss important topics such as everyone's duty to stop hazardous work. We also celebrated World Safety Day and launched a "Choose Safety" video campaign both of which connected people around the important topics. The ultimate goal was to reinforce a commitment to prioritize safety at all times.

With this intensive safety communication together with all actions done in our organization, we were not able to reach our safety targets but we were able to turn the negative trend. We reached TRIF 1.7 in Q4. This outcome shows us that our target 2023 (1.9) is achievable and motivates us to continue our safety efforts in 2023.

## People



**Sustainability continues to be at the core of our strategy and is an important driver of employee engagement. Our new leadership model enables our strategy execution, our sustainability transformation and the development of a diverse and inclusive workplace that will bring out the best in our people.**



Reach top  
**10%**  
cross industry norm  
for Diversity & Inclusion  
by 2025

Our company culture is shaped by our new leadership model based on 3 key principles: Focus on Growth, Collaborate to Succeed and Deliver Value. Our people managers drive our sustainable growth strategy and develop our culture by leading our people embracing growth mindset, deep collaboration and focusing on the outcomes and progress. Recognizing diverse perspectives and creating a workplace where everyone feels they belong is important to us. Kemira is a global company and our employees come from diverse backgrounds. Diversity is one of the greatest contributors to our success and we believe that solving tomorrow's challenges is only possible when we bring together our diverse knowledge, views, experience and passion for what we do.

Our sustainability agenda sets us apart as an employer. Sustainability is a key element of our employer image with 91% of our employees responding that sustainability is important to them. It is also an important factor that attracts new employees to join Kemira. According to our recent Employer Brand survey in several of our larger markets Kemira is viewed very positively for acting responsibly and accounting for our impacts to the environment and society.

To continue developing our employees and help them understand our strategy and the vital role everyone in Kemira plays in executing our sustainability transformation, we continued co-creating learning paths around sustainability and made available a new path selling sustainability for all employees. We measure our employees' engagement with continuous employee listening. Despite challenging environment our employee engagement has been consistently strong in the past few years and continues to be also in 2022: Kemira engagement score was 79 (global manufacturing benchmark 76). The response rate was also very high 81% (benchmark 75%). The relative strengths Speak my mind, Growth and Collaboration have all notably improved 1–2 points in comparison to last year.



## HIGHLIGHTED ACHIEVEMENTS IN 2022

- We defined and launched our Diversity & Inclusion statement as part of our sustainability transformation.
- Our D&I index score improved by 2 points from 2021.
- Two employee networks were launched: the KemPride LGBTQIA+ employee resource network in June and Women's resource network in August.
- We completed a gender pay gap analysis and initiated a continuous screening process to ensure that our good situation continues.
- We implemented our hybrid work model and created a new International remote work opportunity for pilot stage in EMEA.
- The implementation of our future orientated leadership model has progressed very well. Our key people processes such as recruitment, performance and development have been aligned with the Leadership Principles and our managers have been trained.
- Almost 300 ambassadors and managers have participated in our leadership development program.

## THE NEXT BIG THING IN PROGRESS

- The four key initiatives for 2023 in our people roadmap are Diversity & Inclusion, Leadership, Wellbeing and Future competences.
- Boost the awareness and discussion around diversity and inclusion topics through employee networks and focus groups.
- Accelerate the implementation of the Leadership Principles roadmap to continue to transform the culture to enable sustainable profitable growth.
- Continue to develop learning paths and training for employees on physical and mental wellbeing, career growth, and hybrid working.

## CHUAN ZHAO AND VLADIMIR GRIGORIEV, CO-CHAIRS OF KEMPRIDE: SAFE AND INCLUSIVE WORKPLACE WHERE EVERYBODY CAN BE AUTHENTIC

Employee led KemPride network was launched in June with the aim to foster an equitable, safe and supportive business environment for LGBTQIA+ colleagues and their allies. Members across the organization, from different countries have bonded together to drive the KemPride agenda and take actions, such as joining a charity event, Kemira Global Challenge 2022, and organizing a learning session on inclusive language to smash the unconscious bias. Kemira is now a proud member of Workplace Pride, an Amsterdam-based international Non-profit Organization dedicated to promoting the lives of Lesbian, Gay, Bisexual, Transgender, Intersex, and Queer (LGBTIQ+) people in workplaces worldwide.

As individuals, we each contribute our own unique perspectives to the business and to our success as a supplier and as an employer. The ability to share common experiences is key to creating belonging and authenticity and a culture that values what makes us each unique.



"On behalf of KemPride, we are really proud that we achieved so many milestones in 2022. Being a minority group, visibility is so important: connecting and networking help to create meaningful dialogue to help establish a safe environment for supporting LGBTQIA+ colleagues at Kemira. This rainbow journey is more of a marathon than a sprint, and we have just begun the race. We will continue building a fun and inclusive community for all through engagement and collaboration, and with support from our allies and Kemira's leadership."

### Vladimir Grigoriev

Director, Applications & Marketing  
Americas, Kemira

### Chuan Zhao

Manager, Marketing Technologies  
APAC, Kemira

## Water



Clean water is essential not just for life itself, but for making sure we can live high-quality, enjoyable lives. Climate change and the growing global population mean that ensuring everyone has access to this most precious of resources is one of our biggest challenges.



We serve water-intensive industries and our solutions help make more clean, safe water available to everyone. We work with water treatment plants in cities and municipalities helping ensure citizens have access to the clean, safe, and affordable drinking water. Our products also ensure that discharged urban or industrial wastewater meets environmental permit standards, reducing the load on local water bodies.

Water-intensive industries rely on Kemira's products to use less water and make their processes more sustainable, for example by enabling them to use recycled water rather than freshwater in their processes.

Improve our water management to **Leadership level** based on CDP Water Security scoring methodology by the end of 2025.

### OUR WATER FOOTPRINT – AIMING FOR IMPROVEMENT

Kemira is committed to the CEO Water Mandate, advancing best practices in water stewardship. We aim to continuously improve efficiency of freshwater use intensity and improve our water management by striving to upgrade our CDP Water Security scoring to leadership level by the end of 2025. We answered CDP's Water Security questionnaire for the first time in 2021 and achieved score B (management level). In 2022, our CDP Water Security category received again a B score even with the ever increasing requirements for reporting.

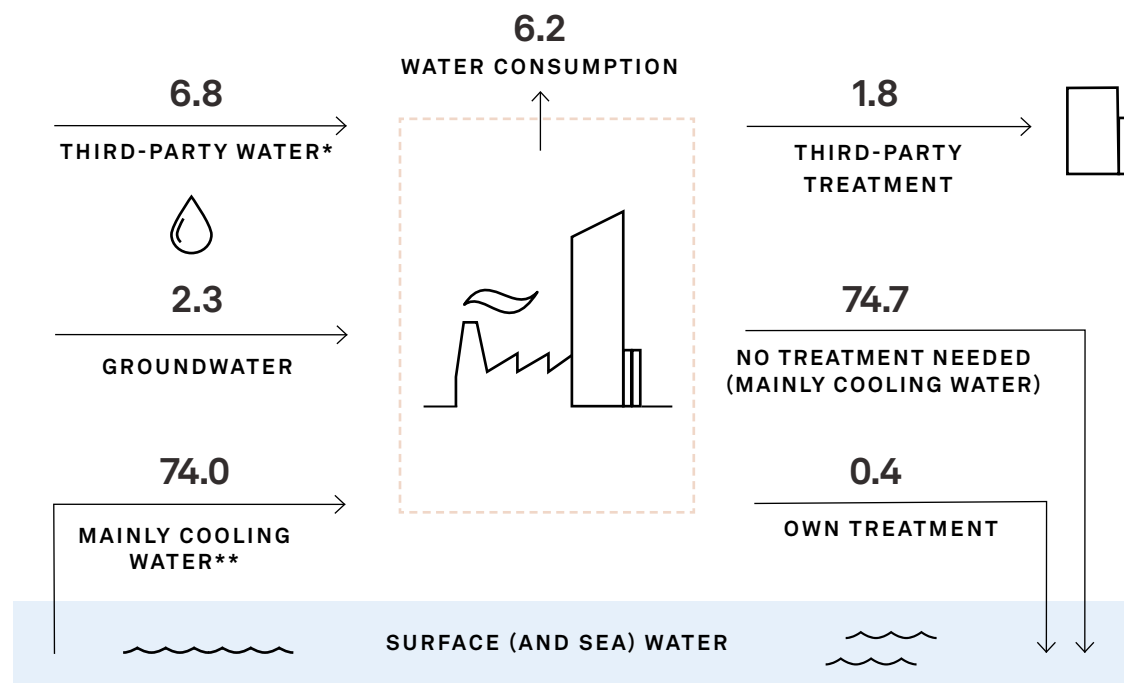
## HIGHLIGHTED ACHIEVEMENTS IN 2022

- We made progress in improving water management, as our CDP's Water Security disclosure total score remained as B (Management level) under stringent scoring criteria with general improvement in category scores.
- Freshwater use intensity reduced by 8% from 2021 and 17% from the baseline year 2019. The reduction results from decrease in the proportion of water intensive products and process improvements.
- We conducted extended water risk assessment, which included scenario analysis based on site locations. No site specific operational water related risks were identified with substantive or strategic impact on our business (financial implications above EUR 10 million) in timeframe of 3 to 6 years into the future. According to pessimistic scenario analysis (RCP 8.5), by 2040, 15 of Kemira's manufacturing sites will be located in water stress areas compared to current 9 sites.
- Award-winning breakthrough in phosphorus recovery: Kemira ViviMag® was granted the silver award in the "Breakthroughs in Research & Development" category of the project innovation competition, with 203 submissions from 52 countries at the International Water Association's 2022 World Water Congress & Exhibition. Read more in [kemira.com](https://kemira.com).

## THE NEXT BIG THING IN PROGRESS

- We have started a project to address identified data gaps in water flow measurements to improve accuracy of Kemira's water balance. The objective is to improve both site level and production line level water balance accuracy.
- Extend water risk assessment further to understand future water related risks in different scenarios better on site level and the whole value chain.
- Continuously extend coverage of Life Cycle Assessments in our product portfolio to better understand and quantify water related impacts in our whole value chain.

DIAGRAM OF WATERFLOWS (MILLION m<sup>3</sup>)



\* Third-party water includes 0.1 million m<sup>3</sup> of wastewater to Kemira's treatment.  
 \*\* 99% cooling water and 1% process water.

## CASE

### Online analytics improve capacity

Kemira helped the Finnish city of Joensuu unlock capacity and improve their sustainability by predicting surges in volume and stabilizing their processes with Kemira KemConnect™ PT. The municipal wastewater treatment plant (WWTP) was designed to process loads of 76,000 population equivalent (PE) a day, but the actual load is closer to 86,000 PE due to surrounding

towns and industry, including a large dairy company. The Joensuu plant made significant energy efficiency improvements as aeration energy capacity increased by 10–20% and generated 10% more biogas from waste after implementing the data-driven technology for enhanced primary treatment. Read more in [kemira.com](https://kemira.com).

## Circularity



**We are committed to enable a circular economy through adopting circular business practices across our own operations and enabling our customers to become more energy, resource and water efficient.**

Our human activities increases pressure on our planet and resources. Circular economy and related principles is our box of tools for reducing harm on the environment.

We can reduce unnecessary costs by reducing the amount of waste we generate. At the same time, sourcing industrial by-products has the potential to both alleviate pressure on natural resources and reduce our raw material costs.

Our key focus is to further decrease the amount of waste to be disposed – through better process optimization, raw material sourcing and innovative technologies.

In 2022, 38% of raw materials used in Kemira's global manufacturing came from recycled sources or industrial by-products. In our inorganic coagulants line, 70–80% of raw material comes from recycled sources (eg. scrap iron and spent pickle liquor). These are used in the treatment of wastewater, drinking

Reduce disposed production waste intensity by

**15%**

to 3.9 by 2030

By 2030, achieve

**>EUR 500M**

revenue from biobased products



water, and in many other municipal and industrial water treatment applications.

Kemira's targets are to achieve over EUR 500 million revenue from our biobased products by 2030 and reduce disposed production waste intensity by 15% by 2030. In the waste target we measure disposed production waste. It includes both hazardous and non-hazardous waste. It excludes waste that is recovered, e.g. via recycling, reuse and incineration with energy recovery. It is expressed as an intensity, metric tons of waste per thousand metric tons of production.

## HIGHLIGHTED ACHIEVEMENTS IN 2022

- Kemira joined the Renewable Carbon Initiative (RCI) to partner with leading companies and accelerate the industry shift from fossil carbon to renewable carbon and raw materials. Membership demonstrates Kemira's commitment to advancing innovative sustainability practices with focus on promoting circularity and a biobased economy.
- Total hazardous waste continued to subside since 2020. Total hazardous waste generation decreased from 2021 mostly due to less production at one hazardous waste intensive site and reclassification of hazardous waste as wastewater at one site. Significant decrease of 45% from 2020 to 2021 was due to closure of the most hazardous waste intensive manufacturing site.
- Product line specific waste data collection started at production lines with most impact in Kemira's reduction target and new waste reduction opportunities through cycling raw material from waste back to process were identified using the data.

Kemira launched a new **Growth Accelerator** unit to drive its long-term growth for selected strategic initiatives in year 2022.

We will also continue to improve our own use of recycled raw materials (currently 24%). In 2022, disposed production waste intensity was 4.4, which is slightly higher than 4.3 in 2021, but 4% lower compared to baseline level of 4.6. The primary reason for the increase from 2021 was disposal of accumulated production waste from previous years at one production site.

- Kemira conducted industrial pilot scale trials together with customers with ViviMag™, a patented technology to recover phosphorus and other valuable resources, such as iron, from sewage sludge. The technology has been developed by Wetsus, the European center of excellence for sustainable water technology, and Technical University Delft with Kemira, several other private companies and municipal water companies.
- Development work with Kemira's external biobased partnerships progressed and technical proof-of-concept proceeded according to plan in 2022. Several application trials with renewably sourced, biodegradable polyhydroxyalkanoate (PHA) which is an alternative for fossil-based barrier materials were carried out and coated materials were converted with high speed cup machines. Also unique engineered polysaccharide technology platform for various applications across our product lines progressed.

## THE NEXT BIG THING IN PROGRESS

- Accelerating commercialization of new and unique renewable and biomaterials into existing markets. Current strategic initiatives include e.g. PHA and Alfa Glucan.
- Sustainable textiles are emerging growth opportunity – regulation (EU 2025 and Finland 2023) will open-up new business opportunities in textile recycling and wood based textile fibers.
- Kemira will continue commercializing the ViviMag™ technology directly or through partners.
- Increase efficiency rate of raw material use and decrease generation of disposed production waste at the same in production of wastewater treatment chemicals by addressing new opportunities identified using product line specific data.
- Kemira joins other Finnish companies in a VTT coordinated research project Forest CUMP, which will develop process concepts for capture and utilization of industrial carbon dioxide emissions and further conversion into valuable chemicals and materials.

## CASE

### Breakthrough in the production of biobased water-soluble polymers

Kemira started the first worldwide full-scale production of its newly developed polymer based on biobased feedstock. The first commercial volumes were shipped to one of the wastewater treatment plants of the Helsinki Region Environmental Services (HSY) for trials.

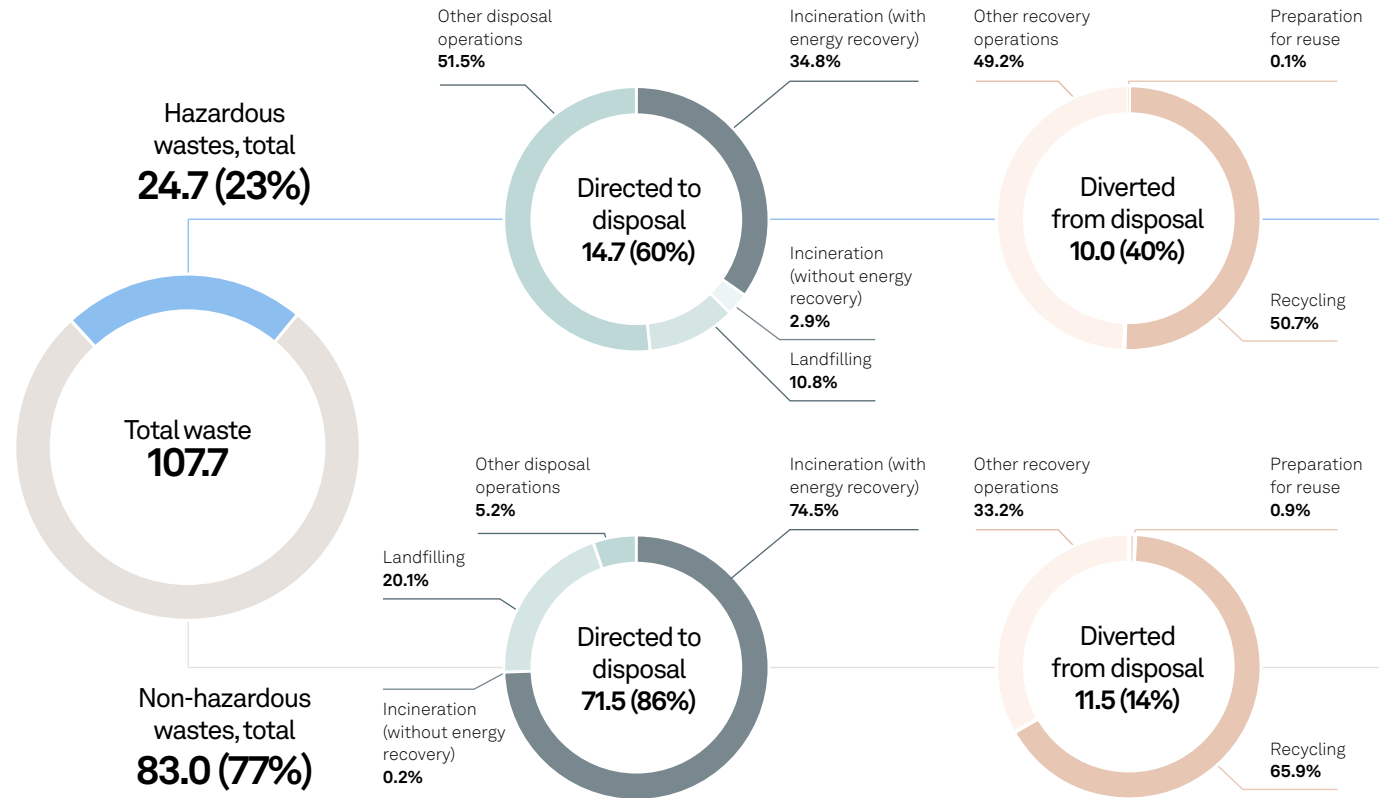
Sustainability is a key driver of our strategy and making our product portfolio greener is one core element of it. The development of completely new and sustainable polymer chemistry doesn't happen overnight and is costly and time consuming.

With this very first biomass-balanced polyacrylamide, a water-soluble polymer, Kemira has succeeded in offering technically equivalent alternative for this special polymer type.

This does not only improve the carbon footprint in our own production but also helps our customers to make their processes more sustainable, without any compromise in performance.

These polymers can be used in various industries, such as the water and energy industry, and potentially also in particularly demanding papermaking applications.

### TOTAL WASTE BY TYPE AND DISPOSAL METHOD (OFFSITE) 1,000 TONS



## Climate



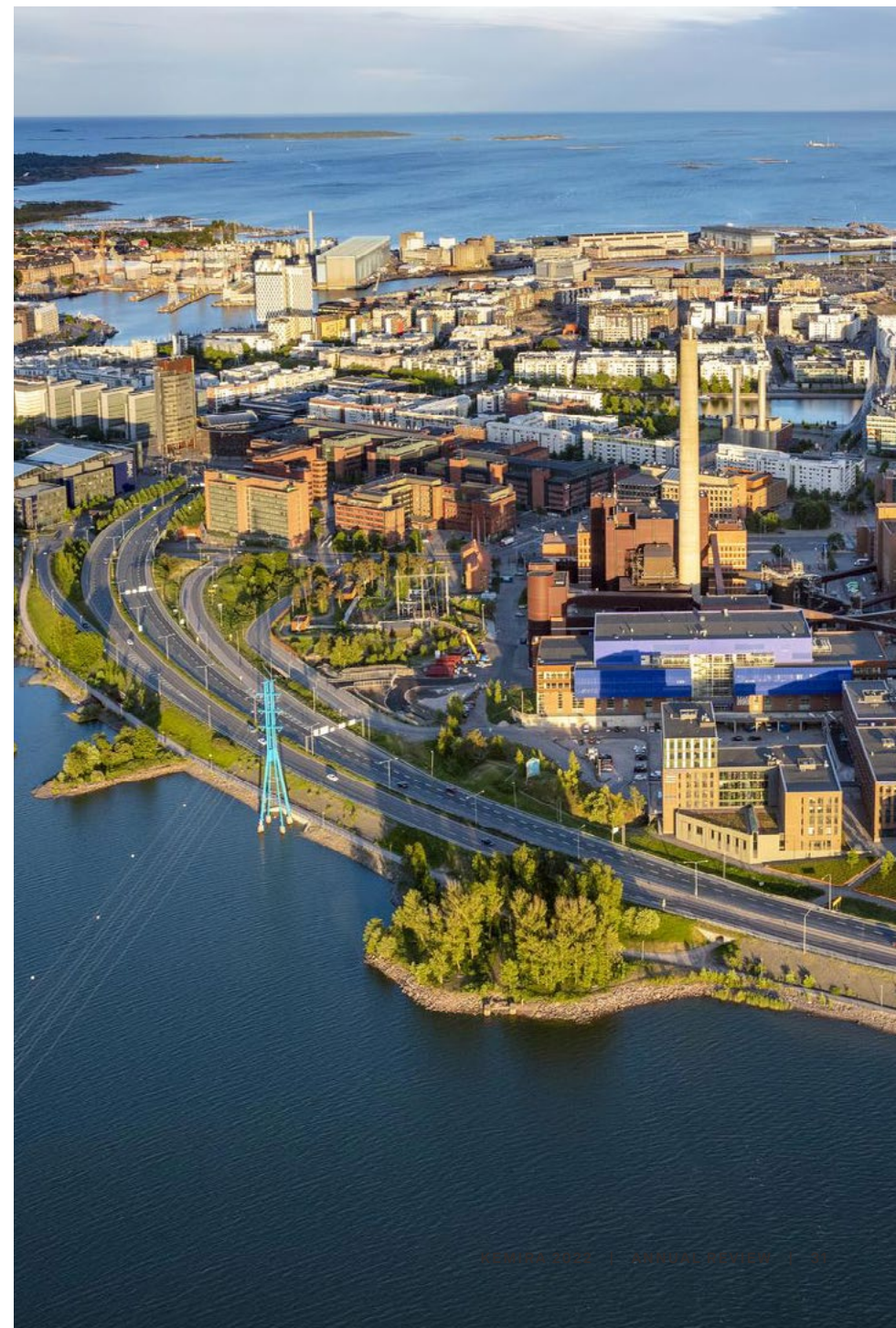
**Kemira supports the ambition of the UNFCCC Paris Agreement. Our long-term ambition is to be carbon neutral by 2045. Our aim is to reduce emissions in our own operations as well as throughout the entire value chain.**

In 2022, we stepped up our progress towards our climate ambitions and committed to the Science Based Targets initiative (SBTi): we set new ambitious target for significant reductions in greenhouse gas (GHG) emissions by the year 2030. Kemira commits to reduce the emissions from its own operations (Scope 1 and 2 emissions) by 50% by 2030, compared to a 2018 baseline of 930 thousand metric tons of CO<sub>2</sub>. This target is in line with limiting global warming to 1.5°C, which is currently the most ambitious criteria for setting emission reduction targets.

For our Scope 3 GHG emissions, we are developing a quantified near-term Scope 3 target within the timeframe and criteria set by the SBTi framework. Specifically, we continue to work with suppliers to evaluate opportunities to decrease the carbon footprint of our purchased goods and services. In addition, our R&D function is working towards developing more products from biobased and industrial by-products raw materials, helping to further reduce our Scope 3 emissions in the value chain.

Ambition to be <b>carbon neutral</b> by 2045 in Scope 1 & 2	<b>50% reduction</b> of GHG emissions by 2030 (Scope 1 & 2)*
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\*Measured as % change in combined Scope 1 and Scope 2 greenhouse gas emissions compared to a 2018 baseline of 930 kt CO<sub>2</sub>eq.



## HIGHLIGHTED ACHIEVEMENTS IN 2022

- Increased nuclear energy-based electricity supply (zero carbon emissions) in the future in Finland (Olkiluoto 3 plant unit), in the United States (Georgia; Plant Vogtle Unit 3), which will enhance Kemira's Scope 2 emissions reduction pathway toward our 2030 target.
- Our Helsingborg, Sweden site renewed its electricity sourcing contract (October 2022 through December 2023) including Guarantees of Origin from wind power which will account for 50% of the site's sourced electricity consumption. Scope 2 emissions will be reduced by approximately 13,000 tons of CO<sub>2</sub>e/a.
- We began cooperation with Gasgrid and Ovako to assess and develop pipeline transmission, storage and use of hydrogen for customers. At Kemira's Joutseno plant, hydrogen is generated as a by-product of chlorate production. The project will enable Finland's first full hydrogen value chain from electricity through chemical industry by-product hydrogen to green steel industry end products, promoting strong sectoral integration and the development energy and raw materials system.

## THE NEXT BIG THING IN PROGRESS

- Kemira's San Giorgio (Italy) polymer manufacturing site signed an agreement for the installation of a 3 MWe gas trigeneration (combined cooling, heating, and power) system to supply the manufacturing energy needs and a 0.5 MWe photovoltaic carport plant. The project will reduce primary energy consumption by approximately 25% and will provide approximately EUR 600,000 per year savings on energy (considering pre-energy crisis prices, or up to EUR 1.1 million per year considering current prices). The trigeneration unit will use 100% green natural gas and will have the capability to also use hydrogen.
- Kemira will continue to evaluate opportunities to increase participation in hydrogen hubs and distribution networks, along with natural gas replacement projects at its highest fuel consuming sites, as these technologies become more available, reliable and cost effective.
- Kemira began the process to align its climate risk assessment process with the TCFD framework through the implementation of pilot assessment at three manufacturing sites and with various global corporate functions. Kemira will continue to expand the scope of the risk assessment to other locations and functions and intends to fully align and disclose risks in accordance with the TCFD framework.

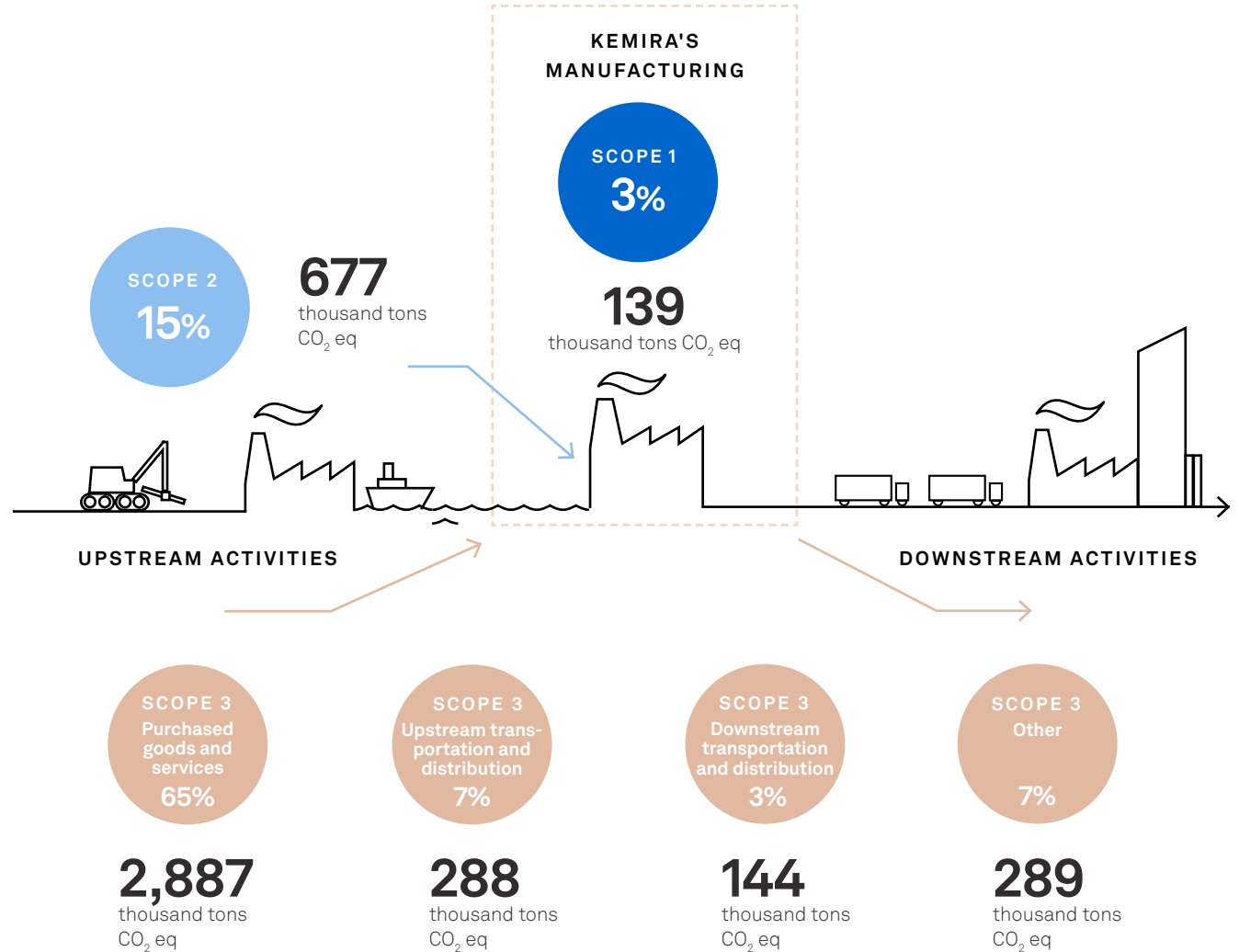


## CASE

To reach Kemira's ambitious climate target we need to focus on renewable energy options such as solar or wind power. In the previous years we have focused on power purchase agreements, but going forward we need to explore site specific opportunities. There are several options available from collaboration with solution provider to direct investments in renewable energy.

As a case example, Kemira's Mojave (California, United States) coagulant manufacturing site finalized an agreement to install an on-site photovoltaic solar system (927 kW), which will provide 100% of the site's electricity needs (approximately 2 GWh/a of renewable, zero-carbon emission electricity). There have been some unforeseen delays due to supply chain dynamics. However, the project is developing and is currently in the equipment procurement phase. Operation is expected in the 2nd quarter of 2024.

## GREENHOUSE GAS EMISSIONS



**KEMIRA** is a global leader in sustainable chemical solutions for water-intensive industries. We provide the best-suited products and services to improve our customers' product quality, process, and resource efficiency. Our focus is on pulp & paper, water treatment, and energy sectors. In 2022, Kemira had annual revenue of around 3.6 billion and around 5,000 employees. Kemira shares are listed on the Nasdaq Helsinki Ltd.

**[WWW.KEMIRA.COM](http://WWW.KEMIRA.COM)**