





Our Sustainability Plan



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About Avantium

**We believe
in a fossil-
free world.
Let's go!**

Avantium is a pioneer in the emerging industry of renewable and sustainable chemistry. Headquartered in Amsterdam, we employ approximately 200 people, with extensive R&D laboratories and three pilot plants in Geleen and Delfzijl, the Netherlands. We are an innovation-driven company dedicated to developing and commercialising breakthrough technologies for the production of chemicals from renewable sources and circular plastic materials used for a variety of consumer products.

Avantium offers unique technological solutions to address the global need to reduce plastic waste, tackle climate change and transition into a circular, sustainable biobased economy. Our goal is to make economically competitive and scalable chemicals and materials that are produced based on renewable feedstocks. Our aim is to produce materials with superior performance that are fully recyclable with a significantly lower carbon footprint.

Our mission is to create disruptive technologies, bringing them to the world with partners, to accelerate the transition towards renewable and circular products. We foster a safe and vibrant place to make an impact. Let's describe what this means to us.



At Avantium, sustainability is built into our very purpose

It drives our employees, informs our developments and excites our commercial partners. Every technology we develop affirms our commitment to being part of creating a fossil-free future for the planet.



We create disruptive technologies across entire value chains

We have a continuous pipeline of proprietary disruptive technologies and we use our core expertise in high-throughput experimentation to test our ideas. Our focus is on the polyester value chain as its broad reach provides the largest potential to transition the chemical industry to fossil-free. We are experts at relating small-scale R&D to large-scale processes and use this knowledge to bring our technologies to commercial scale.



Bringing our technologies to the world with partners

We are not in this alone nor do we do it alone. We bring technologies to market in collaboration with like-minded partners from all around the globe. Partner selection and engagement is core to our activities as we work together for global deployments and positive environmental impact.



Accelerating the transition towards renewable and circular products

We invent novel renewable chemistry processes to make chemicals and materials from renewable sources or feedstocks. We select opportunities that have the potential to be game changers in the circular economy.



Fostering a safe and vibrant place to make an impact

We embed our safety culture in everything we do, striving to be accident - and incident - free. We attract talent from all over the world, creating a workplace where people are both inspired and inspire each other to work on things that can make a significant positive impact to our collective future.





Foreword

Tom van Aken
CEO, Avantium



A fossil-free
chemical
industry
by 2050



In 2020, Avantium published the Sustainability Manifesto, which set out a pathway for our company in tackling the global climate emergency. We pledged, by the end of 2020, to create a time-bound action plan setting out ambitious 2030 targets to enable Avantium to play an active role in accelerating the transition to a fossil-free world.

Chain Reaction 2030 is our plan. It is centred around a bold and audacious vision: A Fossil-Free Chemical Industry by 2050. I believe we are the first company to embrace this specific level of ambition for the chemical industry. *Chain Reaction 2030* commits Avantium to a wide-ranging series of goals and targets, from the impacts of our own technologies and operations, to the way in which we use our voice across our industry, embracing future generations as well as our own colleagues.

We will accelerate innovation to deliver products that use renewable carbon and support the circular economy. We will strive for net zero emissions in our own operations. We will quantify the CO₂ savings we can catalyse across the chemical sector. We will embed sustainability criteria in our use of renewable feedstocks. I want Avantium to be one of the greatest places to work in the Netherlands and for us to embrace diversity and inclusive practices which are no longer optional extras in our increasingly polarised global society.

We cannot achieve these targets alone. But I am determined that where we have direct control over the impacts of our technologies, we are best in class. And that we will do more – bringing partners and other stakeholders on board to accelerate the journey. *Chain Reaction 2030* will be our compass.

For the first time, we are now committed to sustainability targets that can be measured. We realise that these targets are ambitious, and where there are challenges in meeting them, we will explain why. If they prove easier than we anticipate, we will stretch our ambition still further. Science tells us that we can no longer bargain with nature and hope that climate volatility will prove less harmful than the extreme scenarios suggest. That volatility is no longer hypothetical – it is here.

Chain Reaction 2030 represents a deepening of our commitment to achieving a fossil-free chemical industry. It gives us a sense of urgency and guides our business to ultimately help transform our industry as a solution to the climate emergency.

I look forward to working with anyone interested in helping us achieve the vision of Chain Reaction, transforming the chemical industry for a world sustained by renewable technologies. We cannot afford to fail.



Our Approach

Chain Reaction 2030 is our ambitious strategy to help transform the chemical sector with our aspirational goal of achieving a fossil-free chemical industry by 2050. We know that we don't have all the answers and that there is a limit to how much we can achieve by ourselves. In fact, we need to work with others given the interconnected and complex challenge of shifting away from fossil feedstocks across the chemical industry. We actively seek out partnerships and collaboration to ensure that we bring parties together for the greatest impact possible.

These priorities and targets represent the areas where Avantium can have the greatest impact on the social and environmental issues that matter most to our business and our stakeholders.

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Chain Reaction 2030 - At a Glance

Our Technologies

We will accelerate innovation to deliver products that use renewable carbon and support the circular economy.

Targets



By 2030, our technologies will deliver 1.5 million tonnes of CO₂ savings across the chemical industry.



By 2030, we will become a circular business.



By 2030, 100% of our plant-based feedstock for Renewable Polymers and Renewable Chemistries will come from sustainable sources.

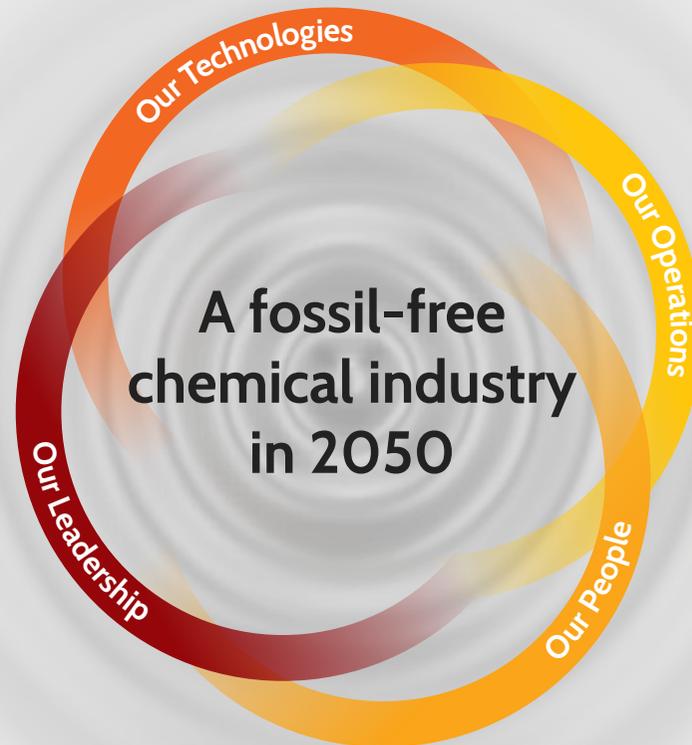
Our Leadership

We will be the leading advocate for greater action by the chemical industry to address the climate emergency.

Targets



By 2030, 100% of our advocacy will focus on transforming the chemical industry to becoming circular and fossil-free.



Our Operations

We will minimise the impact of our own operations and have net-zero carbon emissions.

Targets



By 2030, our own operations will achieve net-zero carbon emissions.



By 2025, we will send zero non-hazardous waste to incineration and landfill.



By 2023, all our plants will achieve an ISO45001 certification (healthy and safe working environment).

Our People

We will mobilise our colleagues and the next generation of scientists to help solve the climate's most pressing problems.

Targets



By 2030, Avantium will be one of the 10 best companies to work for in the Netherlands.



By 2030, we will have engaged 100,000 students about using chemistry to create a fossil-free world.



By 2025, we will improve upon our baseline of being an inclusive and diverse company, ensuring that we are representative of the societies and communities we operate within.



Our Technologies



Targets



By 2030, our technologies will deliver 1.5 million tonnes of CO₂ savings across the chemical industry.



By 2030, we will become a circular business.



By 2030, 100% of our plant-based feedstock for Renewable Polymers and Renewable Chemistries will come from sustainable sources.



Sustainable Technologies

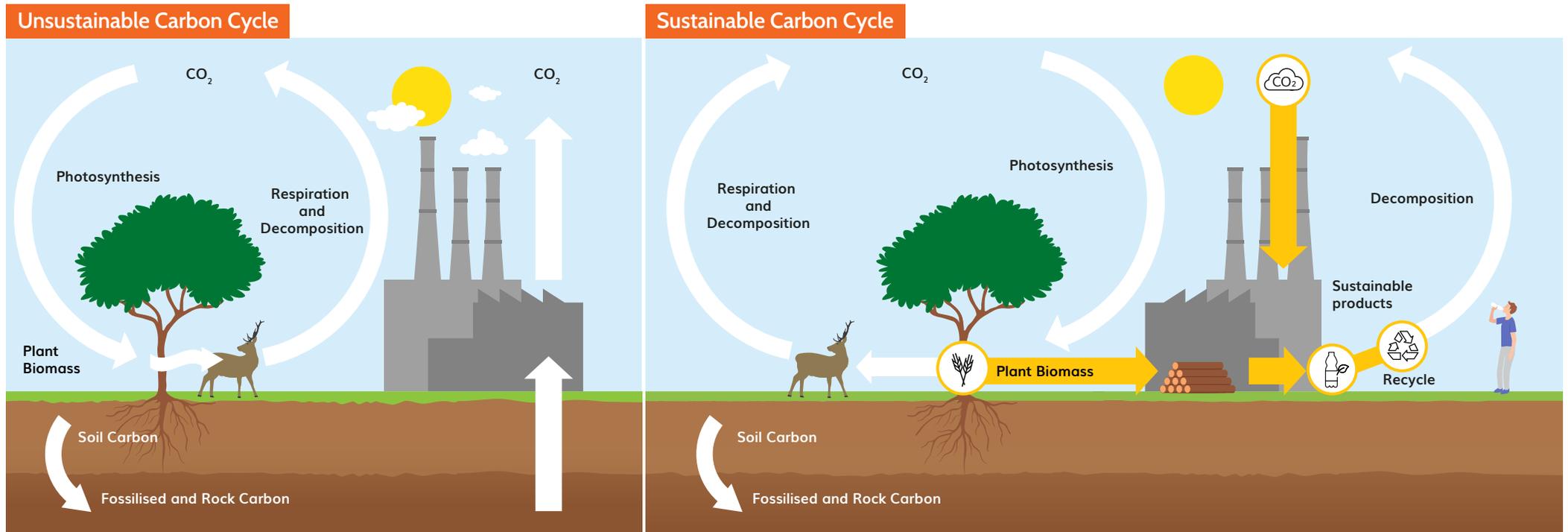


The carbon cycle is Earth's way of maintaining a stable climate and carbon balance. Humans have disturbed this delicate balance with the increasing use of coal, oil and natural gas. Using these fossil-based carbon sources releases more carbon than nature is able to absorb and the excess ends up as CO₂ in the atmosphere.

We need a more sustainable approach to maintain the carbon balance in nature. We must have technologies that enable balance and that can be coupled to products that are either recycled and reused or broken down and re-absorbed into the natural carbon cycle. In some cases, existing chemical processes can be used with air- or plant-based carbon in place of fossil-based carbon like coal and oil. In other cases, additional process steps or technologies are required to convert the different feedstocks into the chemicals and materials the world uses today. These new technologies are called sustainable technologies – bridging the gap between sustainable carbon sources and the chemicals and materials needed. The chemical industry needs to

transition towards sustainable technologies in order to reduce CO₂ emissions in the atmosphere and re-balance the world's carbon cycle.

There are many steps that the chemical industry can take towards sustainable technologies. And every step counts, no matter how small. Efficiency gains on existing chemical processes are critical to reducing CO₂ emissions now. In the near to longer-term, the industry as a whole needs to adapt to sustainable feedstocks. A focused approach is required. It should be driven by the imperative to rebalance Earth's carbon cycle by sourcing the sustainable carbon needed for producing the chemicals and materials we desire.

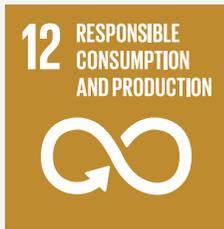




Target

By 2030, Avantium's technologies will deliver 1.5 million tonnes of CO₂ savings across the chemical industry.

Sustainable Development Goals



Our Approach

Avantium specialises in accelerated R&D, applying its scientific and research expertise to improve the efficiency of existing processes and invent new technologies for the chemical industry. Our renewable polymers, renewable chemistries and catalysis business units all contribute to significant CO₂ savings either through increased efficiency or novel technologies that have an improved environmental impact over its fossil-based incumbent.

Avantium's technologies will deliver CO₂ savings through:

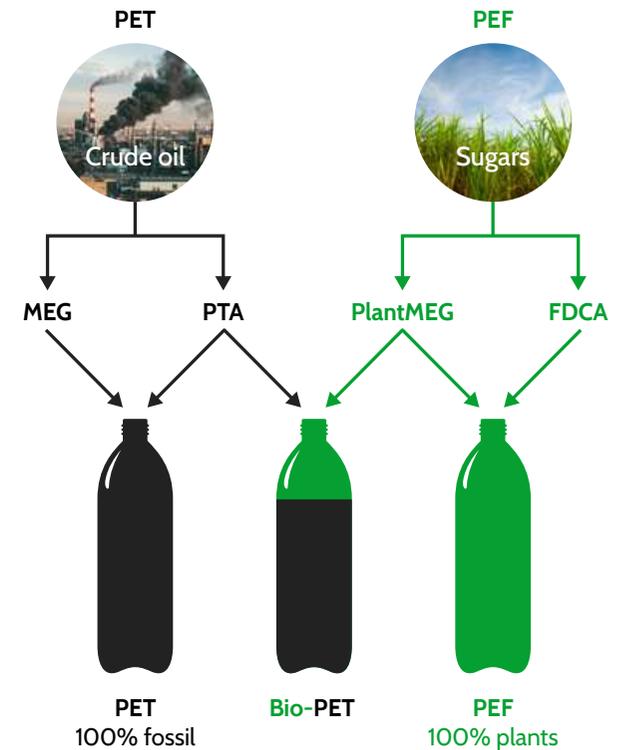
- The commercialisation of its YXY® plants-to-plastics technology for the production of FDCA (furanedicarboxylic acid), the key building block for PEF (Polyethylene Furanoate).
- The scale-up of Ray Technology™ for the production of plantMEG (mono-ethylene glycol).
- The conversion of carbon dioxide (CO₂) via electrochemistry to valuable ingredients and sustainable chemical building blocks.
- Improving efficiency in the broader chemical and petrochemical industries using its proprietary high-throughput catalysis platform.

Future Plans and Next Steps

Some of our near-term plans include:

- Continuing to use Life Cycle Analysis for our technologies as these will confirm the reduction in environmental impact between Avantium's renewable products and the market incumbent.
- Estimating the impact of scaled up technologies per licence.
- Quantifying the role our Catalysis business unit plays in supporting customers to reduce CO₂ via accelerated R&D.

A 100% green plastic bottle can only be produced using plantMEG and FDCA



PET = polyethylene terephthalate PEF = polyethylene furanoate
MEG = mono-ethylene glycol PTA = purified terephthalic acid FDCA = furandicarboxylic acid

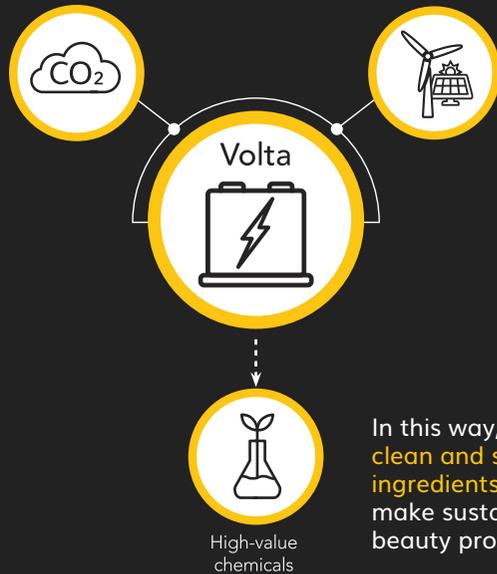


Case Study

Volta - We Make Beauty Sustainable

To create a beautiful future for the next generations, our generation will need to make some changes. Now that we are on the edge of large climate changes, every contribution is important, whether it is from industry or individuals. Let's build the future, piece by piece.

Avantium's Volta Technology provides the means for both industry and individuals to contribute. We developed a technology to **make products and ingredients out of CO₂**. On the road to high impact, our first stop lies with the cosmetic and personal care industry. Because today some of the ingredients that make us feel beautiful are not sustainable and have a negative impact on the environment.

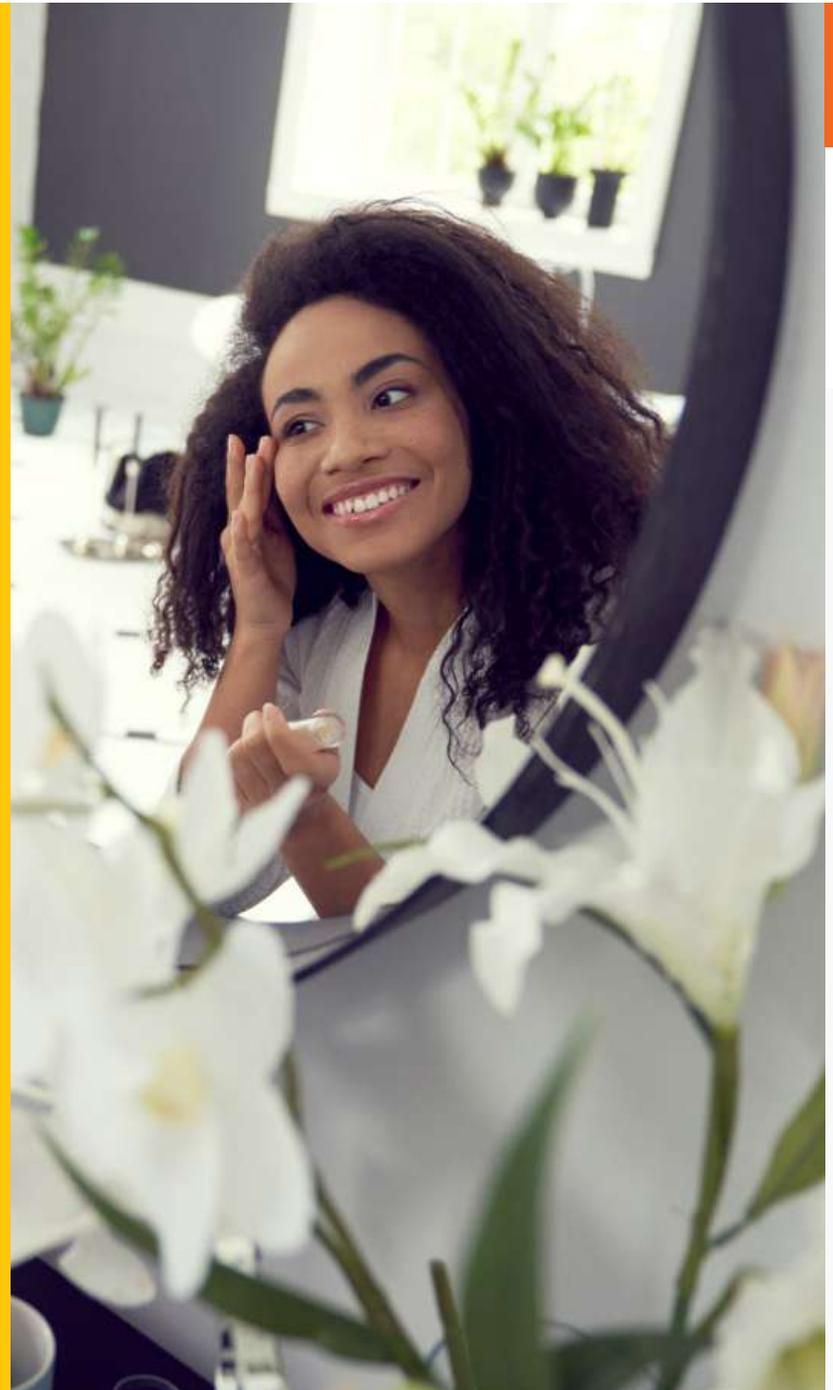


The Volta Technology can convert CO₂ into beauty care ingredients by **using renewable electricity**. This technology is called *Electrochemistry* and is one of the cleanest technologies because it does not use chemicals, but electrons, to convert CO₂.

In this way, the industry can provide **clean and sustainable CO₂-sourced ingredients**, allowing the consumer to make sustainable choices when buying beauty products.

Volta's first target product is Glyoxylic acid. This ingredient is used in skincare and hairstyling products. Glyoxylic acid can also replace toxic formaldehyde in beauty products, providing a cleaner alternative. Volta plans to scale up the process to convert CO₂ into Glyoxylic acid. We do this together with partners, because we know that

together we are stronger. Collaborations allow us to accelerate and stay a frontrunner in the technology development required to build a more beautiful future. Be part of the worldwide commitment to the zero-emissions 2050 goal. With Volta, we make beauty sustainable.



Becoming a Circular Business



The current way of doing business is breaching planetary boundaries and is no longer working for businesses, people or the environment. It needs to change. Today, we take finite resources from the ground to make products that we use, and, when we no longer want them, we throw them away.

Moving to a sustainable, circular economy requires a sustainable use of our resources. This includes taking account of the feedstock used, the energy required, and the use of the material itself. The objective of a circular economy is to create the highest possible value for the longest possible time while consuming the smallest amount of material possible. The circular economy takes the full product cycle, from cradle to cradle, into perspective when designing products and packaging. A circular economy is the solution for the material scarcity we are facing and even though there has been awareness for quite some time of this solution, reality tells us that it is quite challenging to realize circularity.

The Ellen MacArthur Foundation defines the following 3 principles as the foundation of the new, circular economy:

1. **Design out waste and pollution** – waste and pollution are consequences of decisions made at the design stage and where around 80% of environmental impacts are determined.
2. **Keep products and materials in use** – products and materials are kept in the economy by designing them to be reused, repaired and remanufactured.
3. **Regenerate natural systems** – by returning valuable nutrients to the soil and other ecosystems, we can enhance our natural resources.





Target

By 2030, Avantium will become a circular business.

Sustainable Development Goals



Our Approach

Avantium will tackle the circularity challenge with the following approach:

- Design products with renewable materials that are responsibly and ethically produced.
- Develop products that are durable and recyclable creating the highest possible value for the longest possible time while consuming the smallest amount of material possible.
- Develop partnerships within the circular value chain to “close the loop”.
- Develop new business models to extend the use of our technologies or products.
- Develop licensing models for our renewable and sustainable technologies, scaling the production and enabling economies of scale. This will enable Avantium to generate more circular impact.

The ground-breaking technologies Avantium develops are based on the use of renewable feedstocks, underpinning our commitment to being a circular business. By using Avantium technologies, it is possible to produce sustainable alternatives for fossil-based chemicals and materials including plastic bottles for drinks, films for food packaging and electronics, fibers for textiles, furniture and automotive. Our Renewable Polymers and Chemistries businesses will support the shift from linear to circular business models by developing products that support the circular economy. Our Catalysis department will provide its accelerated research capabilities to enable our value chain partners to achieve their ambitions to transition to circular businesses.

Avantium’s technologies produce products that are often at the beginning of the value chain. In order to have fully circular usage of renewable and sustainable chemicals, coordination throughout the value chain is required. All the key players in the value chain can move towards a circular economy only if the right technologies, partnerships, and incentives are connected and deployed.

This requires thought leadership in working with our customers, partners, and service providers like recyclers to create truly circular applications and new business models.

When developing new materials and technologies, we take our responsibility to ensure waste and pollution are not created in the first place before we introduce new products to the market. These technologies will allow other industries, such as the packaging and textiles industry, to develop sustainable and plant-based materials.

We will integrate a circular mindset across Avantium in terms of product design and development through guidelines, training, measurement tools and systems integration. We will test, improve and apply new technologies, materials and business models to enable circularity throughout our operations and value chain. Finally, we aim to collaborate with customers, suppliers, and innovators throughout our value chain to implement new technologies and practices.

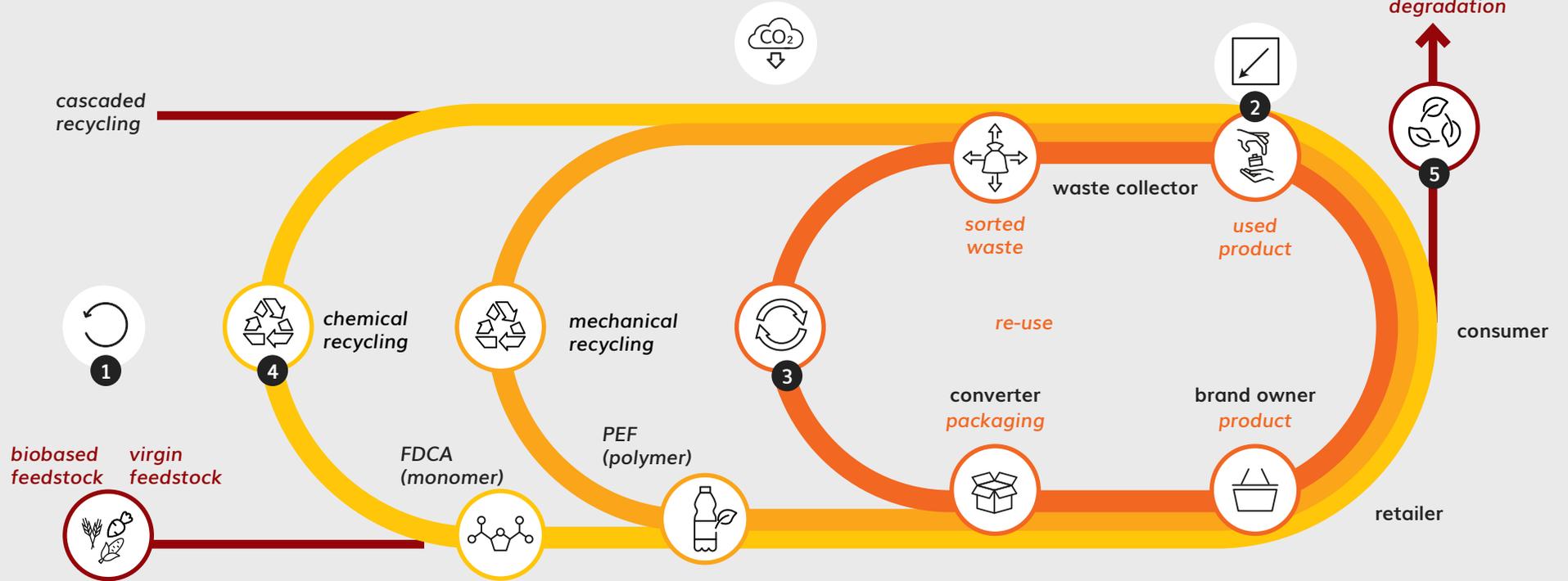
Future Plans and Next Steps

- Ensuring that by 2025, all new technologies we develop will contribute positively towards the circular economy.
- Investigating circular business models for each line of business.
- Providing Sustainable Licences - include recommendations for optimal sustainable application of each technology.



Case Study

PEF solves specific issues in the value chain



Renewable
PEF is plant-based instead of fossil-based.



Reduce
PEF is superior allowing thinner applications and reducing weight by more than 20% in line with European legislation.



Reuse
PEF can be applied in reuse applications directly and in combination with PET.



Recycle

- PEF has a proven fit with existing sorting and recycling facilities.
- PEF can substitute small and multi-layer packaging that cannot be recycled.



Degradable
When PEF unintentionally ends up in nature, tests show that PEF degrades:

- Degradation tests show that PEF degrades much faster than PET under industrial composting conditions (250-400 days with air/oxygen at 58°C in soil).
- Initial results from ongoing 10-year degradability field trial demonstrate that PEF degrades under ambient conditions.

Sustainable Feedstock

Plant-based feedstocks come from nature – these can be agricultural crops, residuals from agriculture or forestry or waste material that would otherwise be incinerated. Balancing productivity with the long-term needs of land, water and biodiversity is an essential element of sustainable technologies as well as the key to the future of using biomass as a major feedstock in the chemical industry.

UN Sustainable Development Goal 15, Life on Land, highlights that nature is critical to our survival. Nature provides us with our oxygen, regulates our weather patterns, pollinates our crops, produces our food, feed and fibre. But it is under increasing stress. Human activity has altered almost 75% of the earth's surface, squeezing wildlife and natural landscapes into an ever-smaller corner of the planet¹.

Sustainable land use practices have the potential to considerably increase yields, mitigate the effects of climate change and provide farmers and growers, their families and their surrounding communities with opportunities to build more prosperous societies.

¹ UN SDGs website:

www.un.org/sustainabledevelopment/biodiversity





Target

By 2030,
100% of our
renewable polymers
and chemistries
plant-based
feedstock will come
from sustainable
sources.

Sustainable Development Goals



Our Approach

Sustainable sourcing presents clear benefits to both nature and our business. Taking good care of nature helps to secure our supplies and reduces risk and volatility in the supply chains of our plant-based feedstocks.

In order to ensure the integrity of our feedstocks, we aim to only partner with suppliers that actively engage in sustainable practices. We will strive to adopt independently certified sustainable standards of feedstock, but when these are not available or appropriate, we will create our own sustainability standards in consultation with subject matter experts and leading NGOs.

Finally, we will incorporate sustainable sourcing requirements into the license agreements of our renewable technologies. This will ensure that as our technologies are deployed, they will be a beacon for not only renewable chemistry but also for promoting sustainable sourcing of plant-based materials.

Future Plans and Next Steps

- Defining sustainability standards for our renewable polymers and chemistries feedstocks.
- Working with our suppliers to ensure that our feedstocks meet our sustainability standards.
- Incorporating the sustainable sourcing of plant-based materials into the license agreements for our renewable technologies.



Our Operations

Targets



By 2030, our own operations will achieve net-zero carbon emissions.



By 2025, we will send zero non-hazardous waste to incineration and landfill.



By 2023, all our plants will achieve an ISO45001 certification (healthy and safe working environment).



Zero Carbon Operations

The climate emergency that we face is no longer news and the science of climate change is well established and undeniable. Climate change is real and human activity is the main cause. The concentration of greenhouse gases in the Earth's atmosphere is directly linked to the average global temperature on Earth. Since the start of the Industrial Revolution, the concentration has been rising steadily and, consequently, the mean global temperatures are increasing with it².

The Paris Agreement adopted in 2015 saw 195 of the world's governments commit to preventing dangerous climate change by limiting global warming to well below 2°C. In order to align with the goals of the Paris Agreement, science-based targets provide companies with a clearly defined pathway to future-proof growth. Those targets specify by how much and how quickly companies need to reduce their greenhouse gas emissions. Targets adopted by companies are considered "science-based" if they are in line with what the latest climate science says is necessary to limit warming to 1.5°C.

² 2018 Intergovernmental Panel on Climate Change (IPCC) report

A 2018 Intergovernmental Panel on Climate Change (IPCC) report outlines the need to reduce current global greenhouse gas emissions by 55% by 2030 and achieve net-zero emissions by 2050 in order for the planet to stay within a 1.5°C increase in global warming. While there will still be serious climate impacts at 1.5°C, this is the level scientists say is associated with less devastating impacts. Every fraction of additional temperature that rises

beyond 1.5°C will bring increasingly negative impacts, threatening lives, livelihoods and economies.

As a whole, the global pace of decarbonisation is too slow. This is in large part due to the fact that we are collectively failing to rapidly phase out the use of fossil fuels.





Target

**By 2030,
Avantium will deliver
Net Zero Carbon
Emissions
from our own
operations.**

Sustainable Development Goals



Our Approach

Our ambition at Avantium is a fossil-free world. We believe in moving beyond the finite energy buried in the Earth towards the infinite energy that surrounds us. A key part of our strategic plan is, as the saying goes, to get our own house in order and establish greenhouse gas emission reduction targets in line with climate science to future-proof our growth.

Our 2030 target states that Avantium will deliver net zero carbon emissions from our own operations (scope 1 and 2) as well as baseline and set scope 3 carbon emissions. Our targets for reducing scope 1 and 2 emissions are science-based and aligned to limiting global temperature rise to 1.5°C.

In order to achieve zero carbon operations, we will focus on the following areas:

- Developing and implementing greenhouse gas ("GHG") reduction and climate resiliency strategies.
- Lowering our GHG footprint by increasing energy efficiency and driving investment in renewables.
- Exploring ways to store away emissions that cannot be avoided, either through natural or technological offsetting schemes.

Future Plans and Next Steps

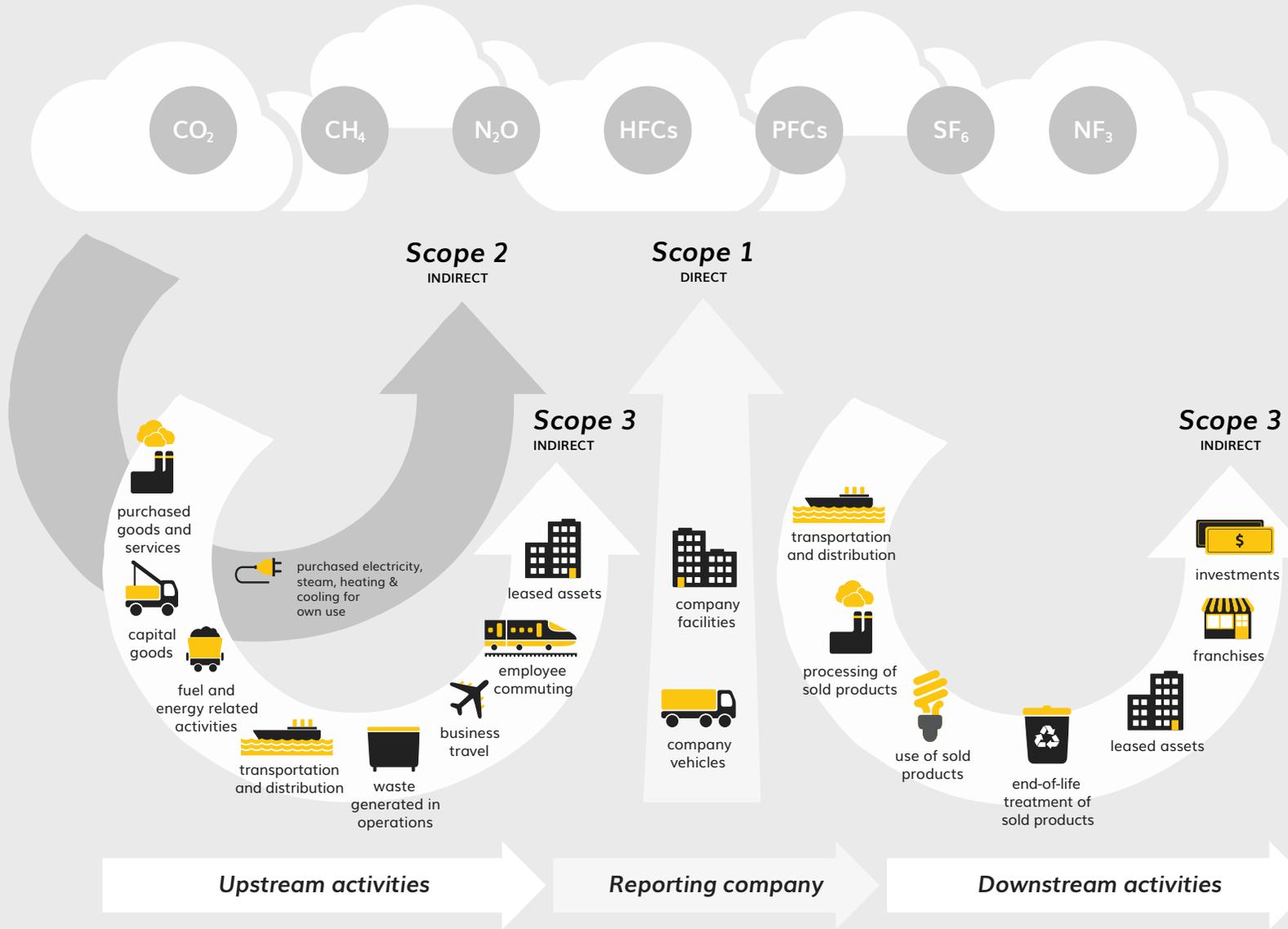
We have outlined some of the ways that we plan to achieve the zero-carbon operations target. We will add to this list when new technologies, partnerships and collaboration are identified.

We will:

- Switch to 100% renewable electricity.
- Calculate direct GHG emissions from our pilot plants and laboratory activities.
- Review alternative heating systems at some of our sites including looking into the availability of biogas.
- Investigate offsetting options for emissions that cannot be avoided and where alternatives are not available.
- Conduct a baseline assessment of our scope 3 emissions and establish a plan for reducing these emissions in line with climate science.



Carbon Emissions - Scope 1, 2 and 3



What are scopes 1, 2 and 3?

Greenhouse gas emissions are categorised into three groups or 'Scopes' by the most widely used international accounting tool, the Greenhouse Gas (GHG) Protocol.

Scope 1 covers direct emissions from owned or controlled sources.

Scope 2 covers indirect emissions from the generation of purchased electricity, steam, heating and cooling consumed by the reporting company.

Scope 3 includes all other indirect emissions that occur in a company's value chain.



Case Study

Promoting Greener Employee Travel

Under our Avantium Mobility Plan, we encourage the use of public transport wherever possible. Employees choosing to travel by public transport receive an NS Business Travel Card, enabling employees to travel for free for all work and personal transport across the Netherlands, including train, metro, tram and bus travel, as well as use of the OV bike system. Employees who travel to work by bicycle are offered the chance to buy a bicycle through the Company bi-cycle plan. Once every three years, each employee can purchase a bicycle through the company provided that this bicycle is predominantly used for commuter travel. Members of the Avantium Management Team are eligible to use the company's fleet of Electric Vehicles.





Zero Waste

Currently, about two billion metric tons of municipal solid waste are produced worldwide every year. The World Bank estimates that this will increase by 70% to 3.40 billion metric tons by 2050 if current conditions persist³. Today, most of the generated waste does not get recycled or composted. Instead, it ends up in landfills and incinerators, impacting the communities close to these facilities and exacerbating the climate crisis.

The current linear system generates a large amount of waste and collectively it needs to be reduced and additionally, as much as possible needs to be repurposed, recycled or recovered. Zero waste aims for the elimination of, rather than simply the management of, waste. Many items that households and businesses currently discard have value to other people, businesses, and communities. Zero waste is a whole-system approach that targets a major change in the way materials flow through our economy. It centres around reducing needless consumption, minimising waste, maximising recycling, and establishing incentives for products that can be intentionally reused, repaired, or recycled back into the marketplace.

It is paramount that waste is managed effectively as the impact of improper waste management can be catastrophic and includes:

- Pollution of soil - waste can leak hazardous chemicals into the soil and from there into our food.
- Air pollution - the burning of waste at landfills releases toxic substances into the air, including extremely poisoning dioxin.
- Ocean pollution – More than eight million tonnes of plastic ends up in our oceans every year⁴.



³ What a Waste 2.0:
A Global Snapshot of Solid Waste Management to 2050,
The World Bank

⁴ UNEP website:
www.unenvironment.org/interactive/beat-plastic-pollution



Target

**By 2025,
Avantium will send
zero non-hazardous
waste to incineration
and landfill.**

Sustainable Development Goals

12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



Our Approach

As a company operating in the chemical industry, we generate both hazardous and non-hazardous waste. For hazardous waste we focus on reducing the amount that we generate and wherever possible recycling residues. The remainder is sent to be incinerated as this waste, in some cases, can pose a threat to people and the environment. Our waste providers are able to combine safe disposal with substantial energy recovery from thermal processing.

For non-hazardous waste, our aim is to send zero waste to incineration and landfill. We will do this by:

- Diverting waste from offices, plants and laboratories and setting standards to embed into Avantium's general facility management and procurement practices.
- Monitoring and applying alternative options for materials generating significant damage to our environment.
- Educating and enabling behaviour change within our colleagues, particularly related to reuse and recycling.
- Wherever possible going 'paperless' including electronic documentation and lab books.
- Eliminating single use plastics from our own operations.
- Aligning our work on zero waste with our commitments on circularity and embracing the nine R's of Refuse, Rethink, Reduce, Reuse, Repair, Refurbish, Remanufacture, Repurpose, Recycle and Recover.

Future Plans and Next Steps

- Partnerships with our waste providers and landlords for rented sites to improve the recycling facilities at all of our operations.
- Working with the Avantium Green Team, introduce programmes to promote reuse and recycling behaviours of Avantium's employees.
- Setting an aspirational interim target of 70% reduction in non-hazardous waste to incineration by 2023.
- Exploring ways of reducing the amount of waste generated from Avantium's operations.





Case Study

Sustainability Week

'Team for Green' is a group of Avantium employees, drawn from across the company, who drive 'bottom up' environmental initiatives to enhance sustainability implementation at our company's headquarters in Amsterdam. Sustainability Week is an annual series of events hosted by Team for Green, engaging with employees across a range of sustainability topics. Throughout the week, Team for Green interacts with employees across the company, sharing information on a range of sustainability topics including waste management. Employees are encouraged to actively participate in events such as quizzes, sustainability photo contests, and giving suggestions for how Avantium and employees can improve their own sustainability behaviour.





Safety First

Occupational accidents and work-related health conditions can have a major impact on individuals and their families economically, physically and emotionally. Furthermore, they can have major effects on companies affecting productivity, causing potential disruptions of production processes, hampering competitiveness and reputation in supply chains, and impacting the economy and society more broadly. The International Labour Organization (ILO) states that this is both tragic and regrettable since research and practice over the past century has repeatedly demonstrated that many of these instances are largely preventable.

The ILO estimates that each year 2.78 million workers die from occupational accidents and work-related diseases and an additional 374 million workers suffer from non-fatal occupational accidents. It is estimated that lost workdays globally represent almost four per cent of the world's GDP, and in some countries, this rises to six per cent or more⁵.

Good Health and Safety management within businesses – as found in the ISO standard 45001 – has proven to not only improve workplace safety and health but directly benefit business productivity, cost-savings and competitiveness on a sustainable basis.



⁵ ILO:

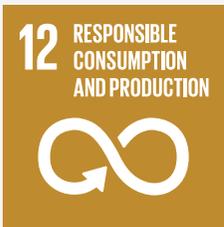
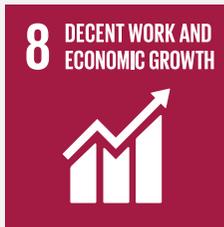
www.ilo.org/global/topics/safety-and-health-at-work/lang-en/index.html



Target

In 2023, all our plants will achieve ISO45001 certification.

Sustainable Development Goals



Our Approach

Health and Safety is our highest priority in everything that we do. All Avantium employees are committed to our list of 'Golden Safety Rules'. These rules remind us every single day that we take safety seriously. We are always focused on improving the implementation of our Golden Safety Rules with robust procedures and systems in place and we are aware that it requires continuous attention and focus to ensure that health and safety remains top-of-mind.

Golden Safety Rules

- We are responsible of our own safety and that of others.
- We give and accept feedback; we ask when in doubt.
- We learn from our mistakes and those of others.
- We take the time to work in a safe way.
- We make sure our work area is clean and tidy.
- We use the right protective equipment.
- We assure immediate containment of unsafe situations.
- We report every unsafe situation.

We already have a strong safety culture and focus heavily on Health and Safety. We will now begin to embed safety into our systems. We will do this by rolling out ISO45001 across our operations as the gold standard for organisations who are serious about improving employee safety, reducing workplace risks and creating better and safer working conditions.

Future Plans and Next Steps

- Proceeding with ISO45001 accreditation.
- Preparing the systems, processes, procedures and documentation for ISO45001.
- Training our people on the new enhanced standard.
- Conducting a pre-audit to understand Avantium's readiness.
- Starting the formal certification process in 2022 with a view to completion in 2023.

Overview of ISO45001

ISO 45001 specifies requirements for an occupational health and safety (OH&S) management system. It guides organisations to provide safe and healthy workplaces by preventing work-related injury and ill health in addition to proactively improving its OH&S performance.

The standard is applicable to any organisation that wishes to establish, implement and maintain an OH&S management system to improve occupational health and safety, eliminate hazards and minimise OH&S risks (including system deficiencies), take advantage of OH&S opportunities, and address OH&S management system nonconformities associated with its activities.

ISO 45001 helps an organisation to achieve the intended outcomes of its OH&S management system. Consistent with the organisation's OH&S policy, the intended outcomes of an OH&S management system include:

- Continual improvement of OH&S performance.
- Fulfilment of legal and other requirements.
- Achievement of OH&S objectives⁶.

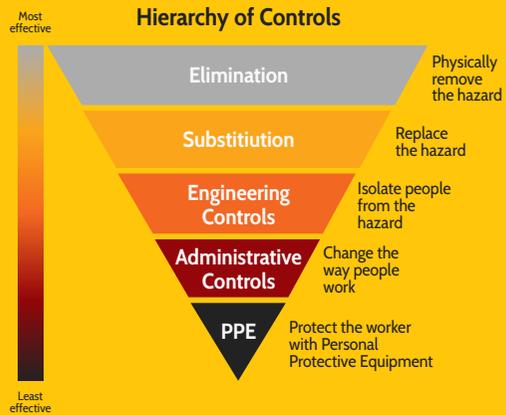
⁶ ISO45001 Standard: www.iso.org/standard/63787.html



Case Study

Hierarchy of Controls

Controlling exposures to occupational hazards is the fundamental method of protecting our employees. Avantium uses a hierarchy of controls as a method of how to approach the design of both chemical and engineering work. One representation of this hierarchy is as follows:



The idea behind this hierarchy is that the control methods at the top of graphic are potentially more effective and protective than those at the bottom. Following this hierarchy normally leads to the implementation of inherently safer systems, where the risk of illness or injury has been substantially reduced.

www.cdc.gov/niosh/topics/hierarchy/default.html





Our People

Targets



By 2030, Avantium will be one of the 10 best companies to work for in the Netherlands.



By 2030, we will have engaged 100,000 students about using chemistry to create a fossil-free world.



By 2025, we will improve upon our baseline of being an inclusive and diverse company, ensuring that we are representative of the societies and communities we operate within.



Great Place to Work

Over the past 10 years and, in particular during 2020, transformations in society, culture, technology, communications, health and wellbeing, and the legal landscape have changed the workplace dramatically. The labour market is becoming more competitive, especially in the area of STEM (Science, Technology, Engineering, and Mathematics), and the battle for talent is intensifying. Businesses now work harder to attract and retain the best talent to stay competitive.

Expectations from employees have moved beyond salary and security to focus on the type of work that they are doing, the culture of the organisation and the flexibility of an employer. A company's purpose and its values can make the difference in bringing talent into the organisation and keeping them engaged.

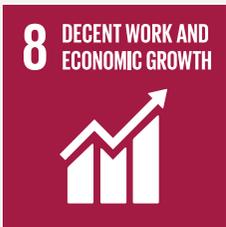




Target

By 2030, we will be one of the 10 best companies to work for in the Netherlands.

Sustainable Development Goals



Our Approach

We are a team of 220 colleagues that are passionate about a fossil-free world. We share a common drive in wanting to make a positive impact and a difference in the world. We do this through our imagination, our creativity, our innovation and our perseverance. We want our employees to enjoy their work, to feel at home and to feel recognised for the contributions to build the future that we want.

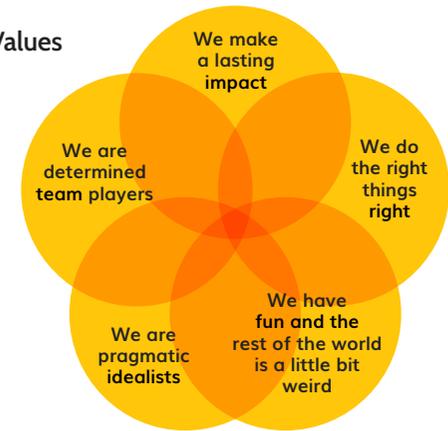
We aim to continuously improve our work environment and culture. We strive to maintain a flat organisation that empowers, recognises and celebrates the many cultures represented. We do this is by making sure we all live and breathe the Avantium values. These values act as our compass and ensure that we are a purpose driven organisation embracing sustainability, wellbeing, diversity and inclusion.

We choose to create a learning environment whereby our employees can grow and learn in their daily work and drive their career paths to areas of interest versus having predefined career paths. We invest in skill development courses, manager training and leadership programs to enable both personal and professional growth of all employees

Recognising and rewarding our people for what they have achieved and how they contributed to those results is an important part of our approach to be a great place to work. This means that each employee's remuneration increase is dependent on their performance as well as how the results were achieved. We look for the achievement of ever greater results through teamwork and cross-functional interactions. In 2021, we will incorporate sustainability metrics in the assessment of overall employee performance.

We strive to be a supportive community where everyone feels they belong and have equal opportunities. We have an inclusive work environment and try to ensure that our people have a work-life balance. We also offer competitive primary and secondary benefits including healthcare, paid holiday time, meal plan and transportation programs.

Avantium's Values



First Moves and Next Steps

Perform a 'Great Place to Work' baseline assessment of workplace to be able to:

- Identify 'strengths' and 'weak spots' for targeted actions.
- Define a short (1-3 years), medium (up to 5 years) and long term (up to 10 years) action plan and measures to utilise strengths and improve weak spots.
- Establish a 'Great Place to Work' team from different business units and different levels of the organisation.
- Define desired employee experience and define improvement areas.
- Implement improvements to enhance employee experience.
- Perform a 'Great Place to Work' assessment again in year 5 to measure progress against the baseline.



Case Study

The Atrium

In 2016, the Avantium headquarters in Amsterdam were renovated to create a new space for the company – the Atrium. Connecting two previously separated office floors, the Atrium provides a central space for the whole company to enjoy. Large windows provide natural lighting, and our green wall enhances wellbeing and improves air quality.

The Atrium is a space for many purposes:

- A communal lunch space, encouraging employees to take a break and connect with each other.
- A meeting space, with small tables for short, informal meetings as well as flexible larger spaces for department meetings.
- A quiet workspace, with small single workspaces built in to enable focussed work and phone calls.
- A space to relax, with coffee machines and relaxed seating to encourage short breaks.
- A space for whole company meetings, with a large screen and sound system.
- A celebration space, for hosting company events and parties.



Inspiring the Next Generation of Scientists



There is clear scientific consensus that we are facing a climate emergency and that we need to invent new and more mitigation actions. A great way to equip our society to address climate change is to raise our overall level of scientific literacy. This starts by promoting and improving STEM (Science, Technology, Engineering, and Mathematics) education. Participation in STEM subjects can help arm students with the skills needed to tackle climate change issues now and in the future.

Enrolment of students in STEM education in the Netherlands is low compared with that of most other western countries⁷, and not only this, but a proportion of Dutch high school students who initially show talent and interest in STEM eventually leave education with a non-STEM-related diploma or choose a non-STEM-related

programme in tertiary education⁸. In today's society where knowledge and skills in STEM could provide a secure future on an individual, societal, and economic level, and where there is a shortage of STEM-trained professionals, we must do more to keep the interest of students throughout their school career.



⁷ OECD. (2016 & 2017). *Education at a glance: OECD indicators*.

⁸ TechniekPact, & Platform Bèta Techniek. (2016).

Monitor: *Facts & figures bètatechniek 2016*.



Target

**By 2030,
100,000 students
will have been
engaged by
Avantium
on using chemistry
for a fossil-free
world.**

Sustainable Development Goals

4 QUALITY
EDUCATION



8 DECENT WORK AND
ECONOMIC GROWTH



Our Approach

Given the scale of the challenge presented by the climate emergency and the need for the chemical industry to shift away from its reliance on fossil sources, Avantium wants to inspire the next generation of scientists to embrace sustainable chemistry and help solve some of the world's most pressing problems. For us to be successful in the long term, we need an inspired and diverse workforce and to achieve this we need to engage with students at key moments throughout their education.

Our approach to inspire the next generation of scientists focuses on three actions:

- Supporting interventions that prove their effectiveness in raising interest and preventing students dropping out of STEM education.
- Developing the right partnerships with STEM education providers so that we are jointly able to reach a critical mass of students. Through these partnerships we will invest in programmes that ensure that STEM education is accessible to everyone, especially those in underserved communities.
- Using our scientific expertise to excite the next generation of scientists about sustainability and the beauty of chemistry.

To date, Avantium has hosted multiple programmes and lab tours for children and high school students showcasing sustainable materials and demonstrating how our company works to advance new technologies for a more sustainable future. This has included highlighting the role of our products (like PEF) in the circular economy. We have held an open 'Weekend of Science' to attract young students to innovation and the need for the journey to a fossil-free world. In 2018, we were proud to contribute to the final Chemistry Examination paper for high schools across the Netherlands.

In 2016, our Chief Technology Officer Dr G.J.M. Gruter, was appointed extraordinary professor of Industrial Sustainable Chemistry (ISC) at the Van 't Hoff Institute for Molecular Sciences (HIMS), one of eight research institutes of the Faculty of Science (FNWI) of the University of Amsterdam. Avantium has a well established collaboration with the University to accelerate the development of new products and processes using electrochemistry and connecting the company to important pioneering research. Several PhD students are working on their theses at Avantium, whilst contributing to the development of our technologies.

First Moves and Next Steps

- Establish a work team with representation from each business unit.
- Define education topics and training goals.
- Define the roll-out (e.g. train-the-trainer) strategy to reach the targeted audience.
- Develop training and education materials on sustainable and renewable chemistry that can be disseminated via social media and other platforms as well as via training programs.
- Map possible partnerships and define collaboration strategies.
- Deliver the training.
- Track and report on the number of students reached.





Case Study

C3 Research on Biodegradability

Avantium produced a 'digiles' (digital lesson) in collaboration with C3 (Centrum Jongeren-Communicatie Chemie), featuring our Chief Technology Officer (CTO) Gert-Jan Gruter. This digital lesson was shown at the Woudschoten Chemie Conference on November 6, 2020, a conference for teachers in chemistry education for the higher levels of high schools (HAVO/VWO students in the Netherlands). Every year more than 350 chemistry teachers from all over the country take part in this conference. C3 presented our digiles to the teachers and taught the teachers how to integrate our lesson in their chemistry lessons. Teachers can use our 'digiles' for 4-5 HAVO or 5-6 VWO classes.

With the digiles, high school students can get acquainted with renewable chemistry and Avantium's research into biodegradable and biobased materials. High school students are invited to experience how they can contribute to a sustainable world. We invite students to make a real contribution to Avantium's research into the biodegradability of materials by conducting experiments with biodegradation. And at the same time, we teach them how to conduct reliable, accurate and valid research. They can send in their research results to Avantium via a webpage on our website.



Watch the video
youtu.be/4_lmhiABe-0





Driving Equality

Equality has been heavily featured in media headlines recently and spurred renewed commitment to racial justice across the world. Individuals, businesses and world leaders have all been compelled to take a fresh and honest look at their behaviour and values. Avantium both respects and celebrates the differences amongst the broad range of nationalities and personalities within our company. Diversity of thought and experience leads to better problem solving and greater innovation.

Gender equality remains a major challenge within the chemical industry. Moving toward gender equality is not only a moral and social issue, it is also vital to the Dutch economy. A new Power of Parity report from the McKinsey Global Institute and McKinsey Netherlands, found that the Netherlands scores well on several indicators of gender equality in society, such as legal protection and digital and financial inclusion of women.

Nevertheless, there is also significant inequality and the Netherlands scores the lowest in Western Europe for gender equality on:

- Number of paid working hours.
- Average monthly income.
- Representation in management positions.
- Students in STEM education.

McKinsey argue that women's potential on the labour market remains significantly untapped and despite numerous initiatives, progress has been limited.

There is no quick and easy remedy to creating a truly diverse workplace – positive, sustainable change requires action by all of us, and we will keep up the work we have started and continue to consult with our people to ensure that we build a business and a culture to be proud of at Avantium.

We will achieve this by delivering against the following sub-targets:

- Gender equality in leadership positions by 2030.
- Maintaining the diversity of nationalities within our company.
- Refine Diversity & Inclusion KPIs, conduct a baseline assessment and establish a plan for improving this baseline.

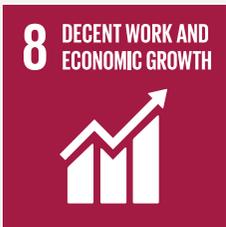




Target

By 2025, we will improve upon our baseline of being an inclusive and diverse company, ensuring that we are representative of the societies and communities we operate within.

Sustainable Development Goals



Our Approach

We know that our differences unite us, and that diversity of thought has shown to breed creativity and drive innovation. So, we have made Avantium a place where everyone belongs. An international community with a universal goal – to create a fossil-free chemical industry. Our differences strengthen us, lead to new ways of doing things and help us meet the needs of our partners and stakeholders. We cultivate inclusion, equality and diversity for all in our workplace.

As part of our diversity agenda, we believe in gender equality and will strive to achieve this at Avantium. In 2019, 29% of Avantium’s Management Team, 25% of our Leadership Teams and 33% of our Supervisory Board were women. The chemical industry is currently underrepresented by women across all levels of organisations. Avantium compares favourably against the industry average but we know that there is still a lot to do across all levels of the company to achieve gender parity and equality.

First Moves and Next Steps

- Refine Diversity and Inclusion company statement and enhance awareness.
- Map diversity (gender, age, nationality) in our main talent pipelines to understand what it means to reflect society.
- Define short (1-3 years), medium (up to 5 years) and long term (up to 10 years) company diversity targets.
- Factor gender criteria into attracting, retention, and succession planning and other HR processes.
- Report gender, age and nationality diversity and include in our company KPI reporting.
- Conduct diversity and inclusion and/or unconscious bias training for Line Managers and recruiters.
- Work with student workstream to encourage a better gender balance studying STEM subjects.





Our Leadership

Target



In 2030, 100% of our advocacy will focus on transforming the chemical industry to becoming circular and fossil-free.





Climate Action

2019 was the second warmest year on record and the end of the warmest decade (2010- 2019) ever recorded. Carbon dioxide (CO₂) levels and other greenhouse gases in the atmosphere rose to new records in 2019. Climate change is affecting every country on every continent. It is disrupting national economies and affecting lives. Weather patterns are changing, sea levels are rising, and weather events are becoming more extreme. This urgent situation is recognised by UN Sustainable Development Goal 13 demanding that we take urgent action to combat climate change and its impacts⁹.



⁹ UN SDGs website:
www.un.org/sustainabledevelopment/climate-change



Target

100% of our advocacy will focus on transforming the chemical industry to become circular and fossil-free.

Sustainable Development Goals



Our Approach

The global climate breakdown demands an entirely new way of doing business, moving the world from its dependence on fossil-based resources towards a more sustainable future. Avantium is focused on accelerating that transition and we will help our customers and partners embrace the essential technologies and products of the future.

Companies often try to avoid politicising their business. However, when it comes to the climate crisis, it is essential that companies support policies and even advocate and champion more aggressive measures that lead us to net-zero emissions.

This target requires us to call for greater action on the need for a fossil-free chemical industry. We will be advocating for changes that support the transition to circular chemicals and materials. We want to lead by example, and we are demanding from ourselves to step up to address the climate crisis. The scale of the challenge demands that we more actively engage and work through partnerships and collaborations with a broad range of stakeholders.

Future Plans and Next Steps

- Build engagement and educate the public on the impact of climate change, by using our voice and advocating for change in the chemical industry via events, media, blogs and through digital platforms.
- Work with stakeholders across the plastic value chain to fundamentally change plastic material by 2030 and empower our partners to shift to renewable and circular solutions.
- Working with governments and industry associations to help inform the debate and help shape climate policy through positive lobbying.



Case Study

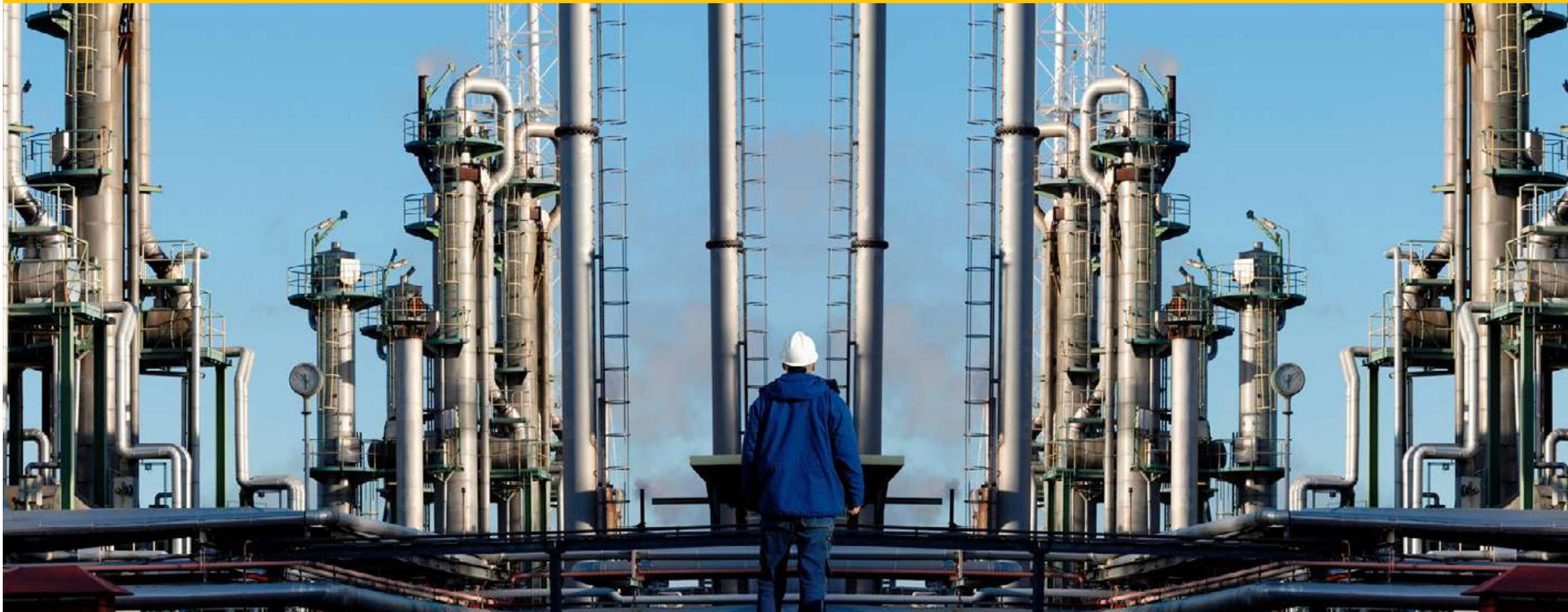
Tom van Aken in Chemistry Top Team

As of January 1, 2020, Tom van Aken has been appointed by State Secretary Mona Keijzer (Economic Affairs and Climate) as SME representative of the Top Sector Chemistry (Topsector Chemie). Together with Emmo Meijer (figurehead), David Pappie (Ministry of Economic Affairs & Climate), Bert Weckhuysen (science representative), Tom van Aken completed the Chemistry Top Team.

What is the Top Sector Chemistry?

There is a global need for clean energy, healthy food, affordable care and dry feet. The Netherlands is strong in finding solutions to these kinds of challenges. This offers our country global growth opportunities. In order to come up with the best possible solutions, companies, researchers, governments and social parties work closely together in nine Top Sectors, including the Top Sector Chemistry.

“The chemical industry faces enormous challenges. At the same time, chemistry also offers the solutions to enable the transformation to a sustainable and circular economy. I try to stimulate good cooperation between science, industry and government through the Chemistry Top Team. This will enable the development and scaling-up of new solutions and also give new companies the opportunity to bring sustainable products to the market,” says Tom van Aken.





Responsible Business Principles

“

We continue to address the most material social and environmental issues for our business

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The following areas are fundamental to embedding responsibility into the core of our day-to-day business operations. They are foundational pillars for our continued success and we take them seriously.

Code of Business Conduct

Avantium conducts its business with integrity and with respect for all its stakeholders. Our first priority is to be a successful business, which means investing in growth and balancing short-term and long-term interests. We care about our customers, our Employees and shareholders, our business partners, and the world we live in.

This Code of Business Conduct is a reflection of our beliefs and values and we want it to have practical value in our day-to-day business. Every Employee must follow the letter as well as the spirit of this Code. The code covers a range of areas including but not limited to integrity at work, age discrimination, working conditions, equal opportunities, conflicts of interest, privacy, financial practices, discrimination, harassment and bullying, and complaints procedures.

Oversight and Accountability

We support progressive partnerships with companies, government agencies, NGOs and academia to develop consistent measurement and make continuous progress. We engage in regular and meaningful dialogue with our stakeholders.

Governance

We have put in place an internal and external governance structure to ensure that we make good progress on our targets, that we are accountable and transparent, and that we continue to address the most material social and environmental issues for our business.

Our Sustainability Steering Committee, comprising senior leaders from across the organisation, meets quarterly to review our progress in sustainability. We are committed to putting in place an external Sustainability Advisory Panel to advise and challenge us on implementation and continuous improvement, make best practice recommendations and advise us on stakeholder engagement.

Product Stewardship

We are currently developing guidelines on product stewardship and plan to publish these in 2021. These will include all elements of our commitment to sustainable feedstocks.

Transparency

We will continue to be transparent and clear about our technologies and processes.

Additional documents available on the Avantium website include the company's Articles of Association, Whistleblower Policy, Bilateral Contact Policy, Supervisory Board Terms of Reference, and the regulations governing the activities of the Audit, Nomination and Remuneration Committees.



Afterword

Zanna McFerson
Managing Director,
Avantium Renewable Chemistries

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Into Action:
Implementing
Chain Reaction
2030

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I am energised and grateful for my colleagues across Avantium for the enthusiasm they have shown in the development of *Chain Reaction 2030*. This plan has been co-created at every stage with input from team members in all our business units and with Management Team support. It has been a truly holistic programme of work.

As we developed this plan, we also sought input from external stakeholders and our Supervisory Board. As the Management Team sponsor for our sustainability efforts, this gives me the confidence that we are well equipped to deliver on the goals and targets to which *Chain Reaction 2030* commits Avantium.

We will report our progress in meeting our targets regularly. This means developing robust data collection systems and seeking external advice to verify that we are performing in the manner this plan demands. We will resource ourselves appropriately to make sure that tackling the climate emergency is woven into every business decision we make in the coming decade.

In the Sustainability Manifesto which committed us to creating *Chain Reaction 2030*, I emphasised that in order to succeed, we want partners who are change makers, share our values and are guided by the same end goals. I hope and believe that this ambitious plan will galvanise many others into action so that we together create a powerful coalition to make good on our ambition of a fossil-free chemical industry by 2050. Avantium has the ambition that this plan not simply makes our company a best in class sustainability leader but will create a ripple effect that draws in others.

Ambitions of this kind stand or fall on the incentives and encouragement offered to the people who must ultimately deliver them. Empowering our colleagues is therefore vital, as we have set ourselves no small task. Myself and the Management Team will ensure we do just that, and I truly look forward to reporting back on our progress.

I always welcome suggestions on how we can best tackle the challenges ahead as we strive for a better tomorrow.

I invite you to share your thoughts with us via sustainability@avantium.com.



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