



Joining Forces for Fossil Free



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Company Highlights 2021



¹The cash flow 2021 is excluding the funds received from the capital raise that took place in April 2021.



Key Financials 2021

(€1,000)	2021	2020	% change
Revenues	10,917	9,863	11%
Other income from government grants	6,686	8,403	-20%
Net operating expenses	(33,687)	(33,173)	2%
EBITDA	(16,084)	(14,907)	8%
Depreciation, amortisation and impairment charge	(7,837)	(7,597)	3%
Finance costs - net	(495)	(325)	52%
Loss for the financial year	(24,416)	(22,830)	7%
Cash flow from working capital movements and adjustments	11,806	9,411	25%
Cash flow from investing activities	(3,932)	(3,453)	14%
Cash flow from financing activities	24,830	(1,946)	-1376%
Net cash flow	8,288	(18,817)	-144%
Cash position	34,911	26,626	31%
Segment revenues			
Catalysis	10,029	9,173	9%
Renewable Chemistries	500	405	23%
Renewable Polymers	388	285	36%
Total segment revenue	10,917	9,863	11%
Other income from government grants			
Catalysis	279	235	19%
Renewable Chemistries	3,610	5,764	-37%
Renewable Polymers	2,683	2,288	17%
Support	114	116	-2%
Total segment other income	6,686	8,403	-20%



Key Events 2021

24 March

Avantium secures new offtake contracts for the planned YXY® Technology FDCA Flagship Plant from Japanese specialty chemical company Toyobo, US polyester film producer Terphane, Dutch bottling company Refresco and one other major global food and beverage brand.

7 April

Avantium reaches a key commercial milestone for its planned FDCA Flagship Plant with offtake commitments for >50% of its output, after securing a contract with Belgian plastic packaging supplier Resilux.



19 May

Tom van Aken is re-appointed as CEO of Avantium.



19 May

Avantium's shareholders adopt all resolutions at the 2021 Annual General Meeting.

2 June

Avantium and Roelofs construct the world's first test road using bio-asphalt with lignin produced in the Netherlands.

11 August

Nils Björkman is nominated as a new member of Avantium's Supervisory Board.

11 August

Avantium announces its first-half 2021 results.

January February March April May June July August September October November December

3 February

Avantium publishes its sustainability plan, Chain Reaction 2030, committing to 10 ambitious targets to be achieved by 2030.

9 February

Avantium signed a patent licence agreement with Eastman Chemical Company for the right to operate under Eastman's FDCA-related patent portfolio.



24 March

Avantium announces a collaboration with Carlsberg to jointly develop several PEF applications, including its Green Fibre Bottle.

24 March

Avantium announces its 2020 results.

15 April

Avantium successfully raises €28 million through an accelerated bookbuild offering.

22 April

Avantium successfully raises €28 million through an accelerated bookbuild offering.

27 May

Avantium is awarded a total of €1.78 million in EU grants for the development of electrochemical processes and CO₂-based polymers.



9 December

Avantium meets all three key conditions for the construction of its FDCA Flagship Plant and announces a positive Final Investment Decision, which is confirmed by shareholders at an Extraordinary General Meeting on 25 January 2022.

Dear Stakeholder,

A year is a long time in business. In last year’s Annual Report, I found myself reflecting on the challenges we faced throughout 2020 and the significant progress we had nonetheless made at Avantium. Now, with 2021 behind us, I am proud to be looking back on an historic chapter for our company – with an even brighter future ahead.

2021 was a landmark year for Avantium. The positive Final Investment Decision (FID) on the construction of our furandicarboxylic acid (FDCA) Flagship Plant, announced in December 2021, was the culmination of a decade of hard work to bring our lead technology, YXY® Technology, from pilot to commercial scale, and a huge step towards realising our vision of a fossil-free world. This achievement was undoubtedly the highlight for Avantium in 2021, but there were positives across all three of our business units, which I am pleased to share with you in this Report.

A Defining Moment in Our Evolution

Confirming the positive FID for our Flagship Plant involved meeting three key conditions: (i) securing sufficient financing, (ii) obtaining sufficient offtake commitments and (iii) finalising the engineering and establishing the supply chain. In 2021, we worked hard to meet these conditions, and in early December we confirmed the final piece of the puzzle: with a €90 million debt financing from a consortium of Dutch banks and the Dutch government-backed impact investment fund, Invest-NL. This debt financing secured the total €192.5 million needed to construct the FDCA Flagship Plant, subject to Financial Close.

Securing this funding is a truly remarkable feat for a disruptive technology company like Avantium, and it paves the way for our transition from research and development (R&D) to commercialisation. Bringing any new polymer to the market is an extraordinary achievement, and I believe that polyethylene furanoate (PEF) has the potential to become a key material worldwide, helping us all on the path to a circular economy.



Message from the CEO

Tom van Aken

“

2021 was a landmark year for Avantium

”



Reaching a positive FID is a key milestone not just for Avantium Renewable Polymers but for our company as a whole. We could not have achieved this without the drive, resilience and perseverance of our talented colleagues, some of whom have been involved in this project for more than 10 years. This success was a champagne moment to end 2021.

Developments in Our Technology Pipeline

While our other technologies are not yet at the same maturity level as YXY Technology, we recorded important developments for each of them in 2021.

In Avantium Renewable Chemistries, a new partnership with Cosun Beet Company will help us to accelerate the commercial potential of plantMEG™ (mono-ethylene glycol) and plantMPG™ (mono-propylene glycol), produced by our pioneering plant-to-glycols Ray Technology™. Elsewhere, in collaboration with the CHAPLIN XL consortium,¹ we constructed the world's first bio-asphalt test road with lignin produced by our Dawn Technology™. Finally, we were awarded a €1.78 million grant by the EU Horizon 2020 programme to develop our Volta Technology; we also commenced pre-pilot testing of the technology at partners' sites in Europe.

Avantium Catalysis continued to be affected by COVID-19 travel restrictions, which prevented installations, maintenance and upgrades of Flowrence® systems at customers' sites. Our own laboratory, however, ran uninterrupted throughout the year, furthering our technological developments in adsorption and analytics.

A significant accident took place in our Ray Technology demonstration plant in 2021. Two colleagues are still recovering, with our full support, after being exposed to hazardous vapours while carrying out cleaning duties (wearing full protective equipment). Workplace safety has always been our top priority at Avantium, and this event came as a terrible shock to us all.

We halted all operations at the plant while we first awaited the results of internal and external investigations and then implemented changes to help avoid such an accident happening again. Fostering and maintaining safe workplaces for all our colleagues will remain the number-one priority across all our sites.

Sustainability, Society and Us

In 2021, even as the world continued to face the threat of COVID-19, the pandemic did not completely dominate the global agenda. We again heard multiple warnings about the growing environmental crisis: among others, the United Nations Climate Change Conference (known as COP26) and the Intergovernmental Panel on Climate Change both called for urgent action to limit greenhouse gas emissions and tackle climate change.

While worldwide organisations and governments set clear expectations for individual and collective action, words alone will not drive the scope and speed of change that is needed. At Avantium, our strategy is focused on clear actions. By scaling up our technologies to produce fully plant-based and circular materials, we can offer the radical innovations our partners need to provide customers with smart, effective and sustainable solutions.

As a company with strong expectations of others in our industry, we must live up to our own high standards. In 2021, we began working towards the goals set out in our sustainability plan, Chain Reaction 2030. Blazing a trail for the chemical industry, it identifies clear and ambitious targets for the future of our business. These time-bound, measurable goals will guide our decisions, raise accountability and generate tangible and meaningful results.

Our People

Of course, we would be nowhere without Avantium's people, who continue to be key to the successful implementation of our strategies. We strive to keep our talented employees engaged, excited and motivated by our vision and values, and to provide a safe, inspiring and dynamic workplace. This year, with office-based working facing further disruption, we paid particular attention to maintaining social cohesion and supporting mental and physical well-being among colleagues.

As part of our sustainability plan, we have set ourselves the twin targets of becoming a more diverse and inclusive company and being one of the top 10 places to work in the Netherlands by 2030. As we shift our focus from R&D to commercial operations, it is especially important to broaden our talent pool and welcome the expertise required to make this transition a success.

In 2021, we appointed Bas Blom as Managing Director of Avantium Renewable Polymers. In early 2022, Nils Björkman was appointed to the Supervisory Board.

A Brighter Horizon

In 2021, we showed that Avantium truly has the potential to be at the forefront of game-changing sustainable chemistry – and I look forward to reaching new heights in 2022 and beyond. I am immensely proud of my colleagues for their continued hard work and commitment, and am very grateful both to them and to all other stakeholders who contribute to Avantium's success.

Together, we can look to the future with optimism, confident in the knowledge that a fossil-free world is closer than ever.

Tom van Aken

Chief Executive Officer

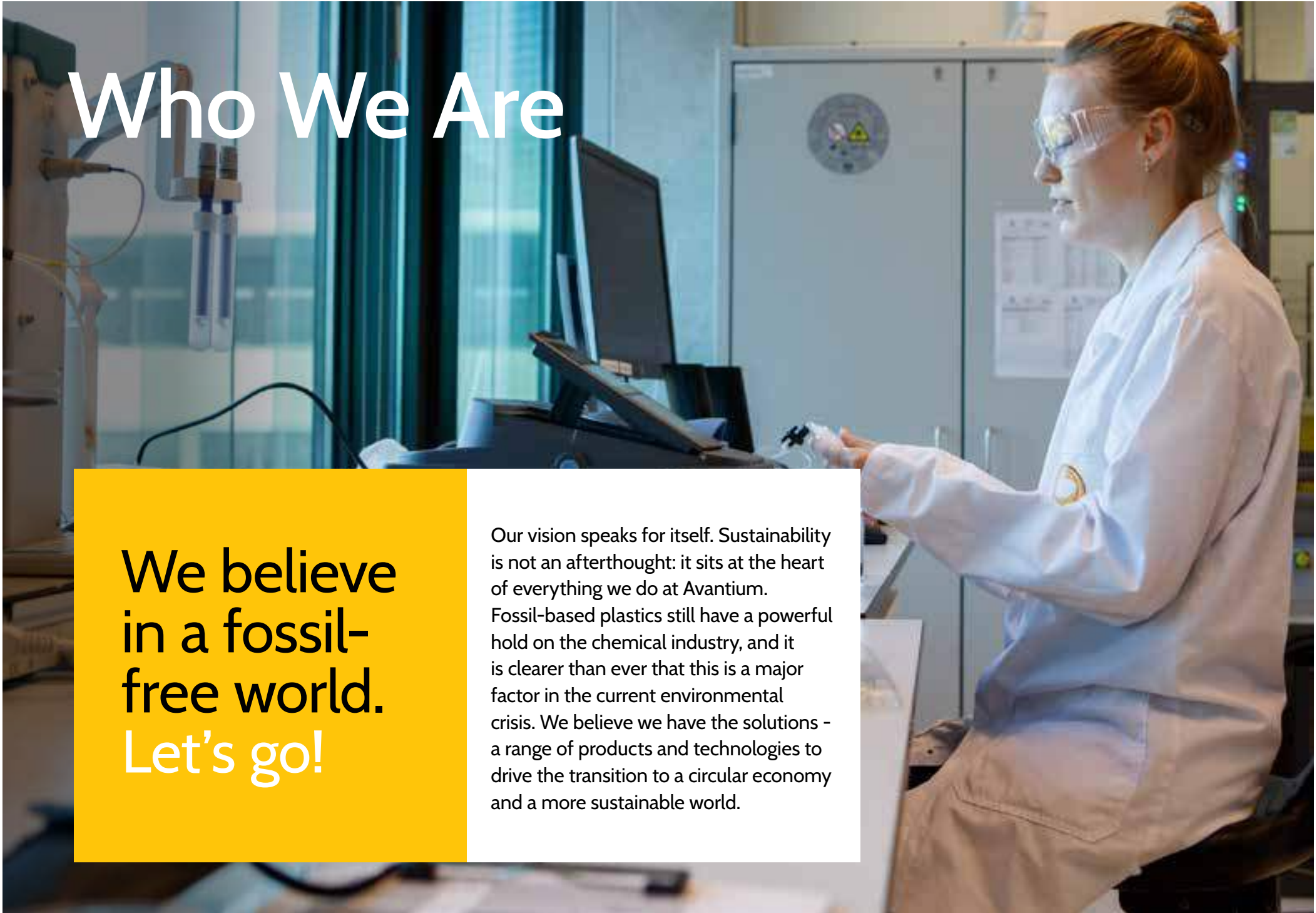
¹ The CHAPLIN XL (Collaboration in aspHalt Applications with LIGNIN) project is comprised of several academic and industrial organisations including: Avantium, Roelofs Groep, Utrecht University, Wageningen Food & Biobased Research, Asphalt Kennis Centrum, H4A Infratechniek and Stichting Biobased Delta.



Who We Are

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

Our vision speaks for itself. Sustainability is not an afterthought: it sits at the heart of everything we do at Avantium. Fossil-based plastics still have a powerful hold on the chemical industry, and it is clearer than ever that this is a major factor in the current environmental crisis. We believe we have the solutions - a range of products and technologies to drive the transition to a circular economy and a more sustainable world.





Our Business Units

We have three business units at Avantium, all united by a common goal: to provide innovative solutions for consumer-driven trends for using renewable sources, cutting out plastic waste and reducing CO₂.

Avantium Renewable Polymers

Avantium Renewable Polymers aims to commercialise its proprietary plants-to-plastics YXY® Technology, used to produce FDCA, the main building block of the high-performance, plant-based plastic PEF. We have fully proven the technology in our pilot plant in Geleen and we aim to complete construction of the world's first commercial plant for FDCA in 2023.

Changing the nature of plastics

End markets
YXY Packaging, textiles and film.

Avantium Renewable Chemistries

Avantium Renewable Chemistries works on viable, non-fossil sources of carbon, making the need for fossil feedstock a thing of the past. We use plant- and air-based sources as the raw materials for innovative new technologies and products. The unit is home to our three lead technologies: Ray™, Dawn™ and Volta.

Ground-breaking technologies for a sustainable carbon future

End markets
Ray Packaging, textiles, solvents and coolants.
Dawn Sugars: feedstock for chemicals and materials.
Lignin: bio-asphalt.
Volta CO₂-based chemicals and polyesters.

Avantium Catalysis

Avantium Catalysis provides advanced catalysis R&D services, systems and testing to customers worldwide, including several industry leaders. Catalysts play a role in limiting the environmental harm of the petrochemical industry, which helps our customers' transition to a more sustainable business. Moreover, our expertise in catalysis continues to benefit our other business units in terms of both revenue and sharing expertise.

Tomorrow's catalysis today

Specialisms
R&D services
R&D systems (Flowrence®, Batchington)
Refinery catalyst testing





Our Technologies

YXY® Technology

YXY Technology is our lead technology. It converts industrial sugars into furandicarboxylic acid (FDCA), a key ingredient for making the polymer known as polyethylene furanoate (PEF).

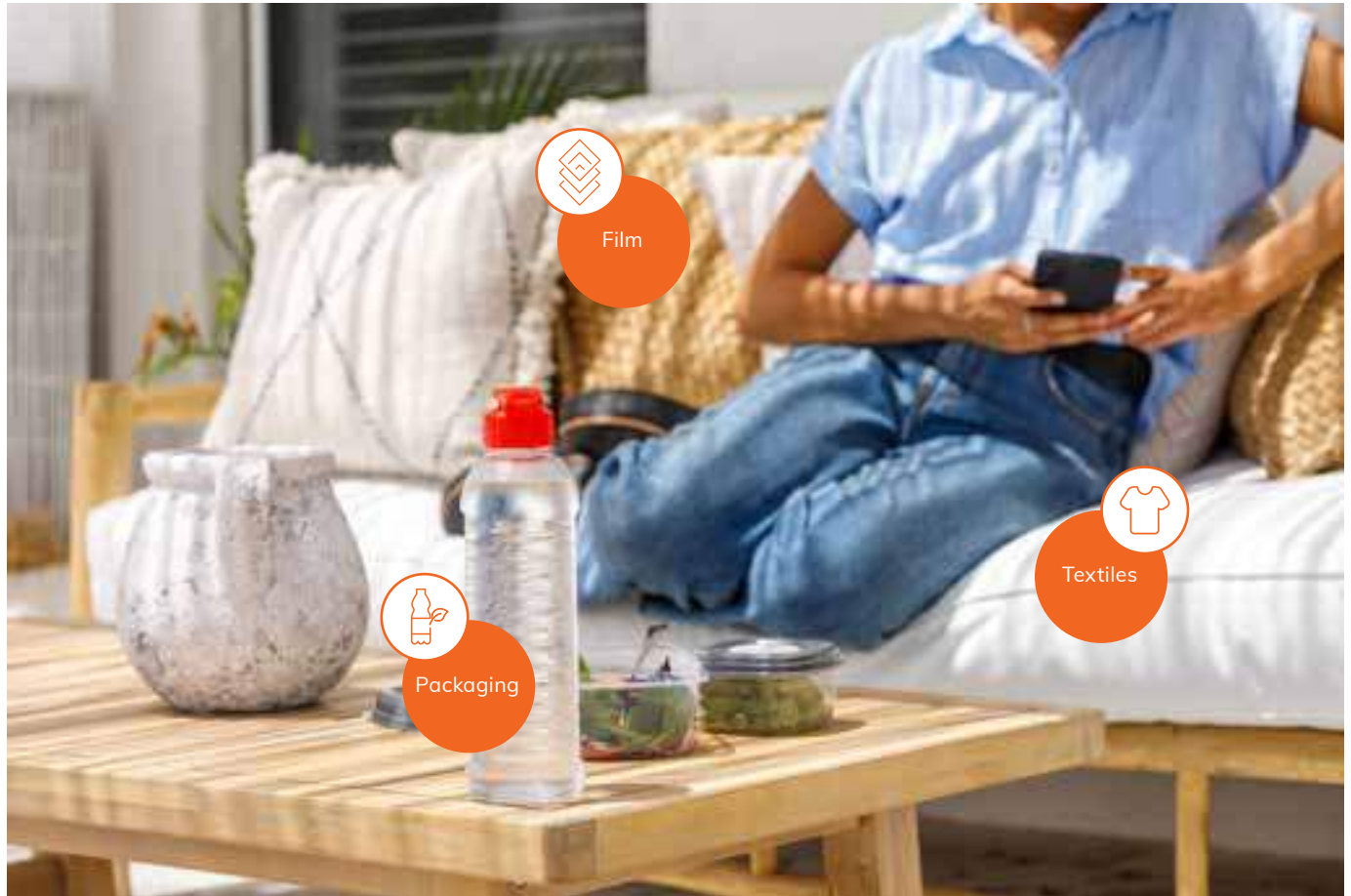
A Next Generation Polymer

PEF is 100% plant based, and outperforms traditional packaging materials such as conventional plastic, glass and aluminium. It has superior barrier properties (meaning longer food and drink shelf lives), higher mechanical strength (enabling thinner packaging), higher heat resistance and a lower processing temperature (needing less energy).

PEF is fully mechanically and chemically recyclable and degrades much faster than polyethylene terephthalate (PET). A 2021 life-cycle assessment (LCA) for single-layer PEF and multilayer PET/PEF bottles showed a significant reduction in greenhouse gas (GHG) emissions of around 35% over the life cycle of the bottles (for details, see our [corporate website](#)).

Realising the Potential of PEF

PEF has huge potential in the packaging, film and textile sectors, which are growing markets already worth over US\$200 billion per year. We have recently confirmed a positive Final Investment Decision (FID) to open the world's first commercial flagship plant for FDCA and PEF, and are working to ensure it is up and running by 2024. A full explanation of our FID can be found on our [corporate website](#).



Our Lead Product: FDCA

Furandicarboxylic acid (FDCA) is a central ingredient for making the polymer known as polyethylene furanoate (PEF). Historically, there was no economically viable way to manufacture FDCA, leading to it being labelled 'the sleeping giant of the chemicals industry' – but that has all changed with the arrival of Avantium's YXY® Technology.

Waking the Sleeping Giant

We believe we can now fully unlock the potential of this product to shape the value chain of PEF. In 2011, we were the first company to build a pilot plant for FDCA: now, one decade on, we are ready to scale up the technology at our Flagship Plant, capable of producing 5,000 tonnes of FDCA per year from plant sugars.

As a monomer, FDCA can realise exciting opportunities to create a wide range of useful and sustainable polymers, and most importantly PEF – a 100% plant-based and recyclable polyester made with FDCA and mono-ethylene glycol (MEG). In the future, we will explore other FDCA-based polyesters, co-polyesters, polyamides, polyurethanes and coating resins.



Ray Technology™

Our proprietary Ray Technology also has an important role to play in PEF production. PEF's other essential building block, alongside FDCA, is mono-ethylene glycol (MEG), traditionally made from fossil sources. With Ray Technology, however, we can turn industrial sugars into plant-based MEG in a single step. As a core component of PEF and PET, this plantMEG™ can accelerate the transition to the fully green and circular production of plastic materials and textiles.

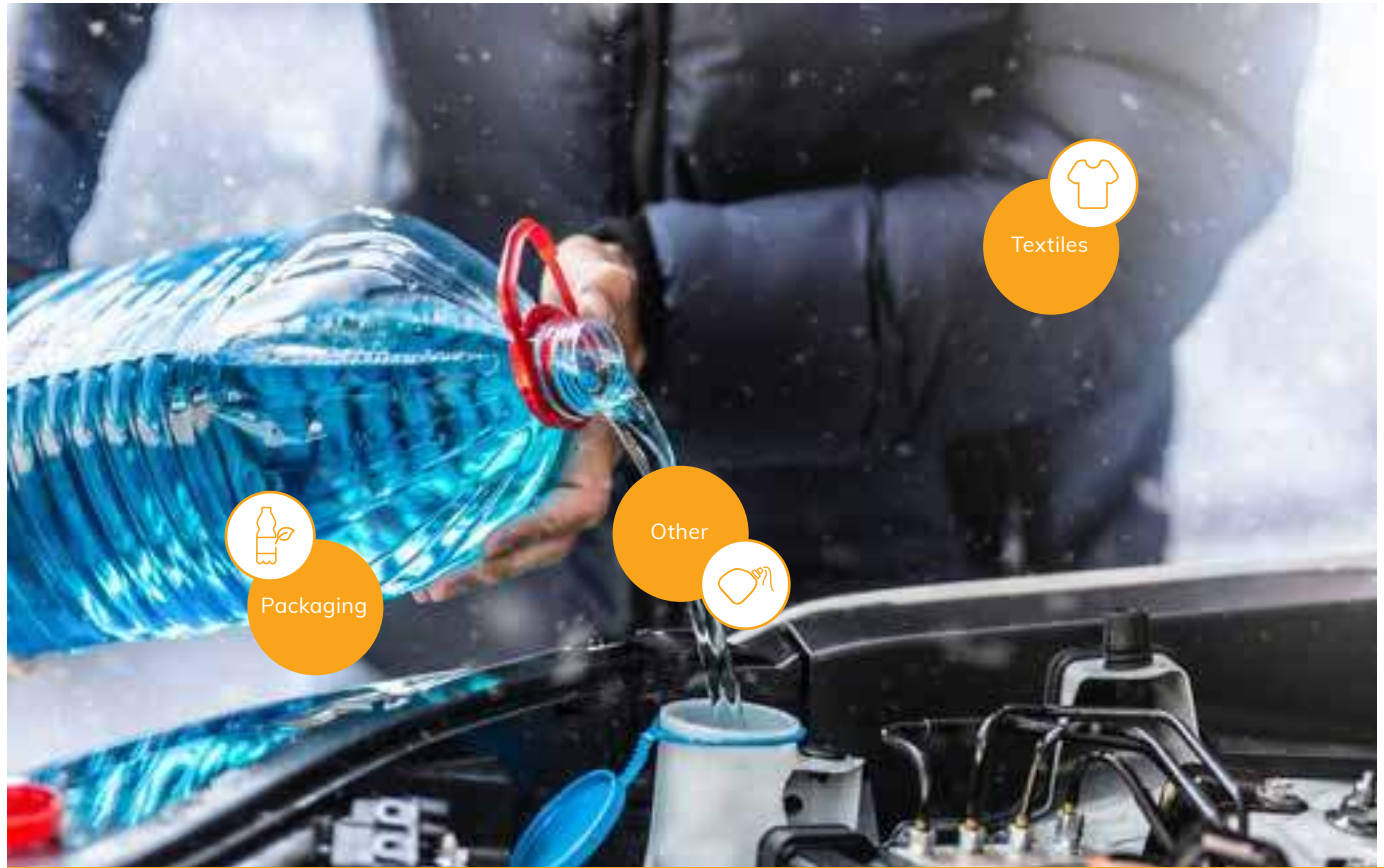
Groundbreaking Innovation

Demand for MEG is projected to grow to 50 million tonnes by 2035. With more than 99% of this MEG currently made from fossil sources, it is more important than ever to reshape the market with our disruptive Ray Technology.

Our 2021 LCA shows that Ray Technology can produce plantMEG with 56–83% fewer CO₂ emissions than traditional fossil-based methods (for full details, see our corporate website). Avantium's plantMEG is thus a far more sustainable alternative than fossil-derived MEG. Crucially, we can achieve this without any compromise on quality or performance.

Planting the Seed for plantMEG™

Following the successful commissioning of our Ray Technology demonstration plant in 2020, we want to go even further. We plan to scale up our operations to a commercial facility, and to implement a technology-licensing business model. To this end, we have joined forces with Cosun Beet Company, planning to jointly construct and operate the first commercial plant for producing plant-based glycols using Ray Technology. For more information, see our [corporate website](#).



A Better Way: plantMEG

With Ray Technology™, Avantium has found a way to produce mono-ethylene glycol (MEG) from plant-based feedstocks, rather than fossil sources. We call this plant-derived compound plantMEG™, and we see it as a key stepping stone towards a greener materials industry.

MEG is a fundamental chemical building block for textiles like clothing and household upholstery, plastic packaging and kitchenware and de-icing products and coolants. With such a wide range of end applications – and a market with a compound annual growth rate of 3.5% – it is vital that we make the production of this commodity more sustainable.

A Green Game-Changer

Ray Technology's single-step catalytic process means that plantMEG is cost competitive with fossil-based alternatives. Not only this, but plantMEG is also identical to the petroleum-based incumbent in performance and quality. In view of such clear benefits, and not forgetting its significantly lower carbon emissions, we believe plantMEG is the game-changer we need to shape a greener future.



Dawn Technology™

Dawn Technology is Avantium's biorefinery technology and the second of the three Renewable Chemistries technologies. A radically improved and modernised upgrade on a 100-year-old method, Dawn Technology converts non-food plant-based feedstocks – like forestry and agricultural residues – into industrial sugars (as used in our YXY Technology and Ray Technology) and lignin (an energy-dense co-product).

A Bio-Based Technology

As the only viable alternative to fossil-based feedstocks, biomass is an essential solution to a fossil-free industry and a bio-based economy. The resulting industrial sugars can replace petroleum as a carbon source, which in turn makes them excellent raw materials for sustainable chemical and industrial processes.

The global demand for alternative feedstock streams and conversion technologies is on the rise. As we continue to develop, optimise and scale up this technology, we are blazing a trail towards a collective greener future for our industry.

Refining Our Operations

Avantium's pilot refinery opened in 2018. In preparation for scaling up Dawn Technology, we are continuing to optimise and de-risk our technology, to test new feedstocks and to develop exciting partnerships and opportunities both up- and downstream.



A New Dawn: Industrial Sugars and Lignin

If the chemical industry is to successfully make the switch to plant-based feedstocks, new sources of carbon will be required to meet global product demands. Industrial sugars, such as those produced by Dawn Technology™, are an ideal solution, as they can be used in place of petroleum-based feedstocks as the starting material for any product.

More than a Co-Product

In our biorefining process, lignin is the mass remaining after the sugars have been removed from the raw material. With an energy content up to 40% higher than the original wood chips, lignin is an extremely efficient material for energy generation.

We are also exploring other high-value applications for this underused polymer, including water purification

and bio-asphalt. Asphalt is traditionally made using bitumen, derived from crude oil, so replacing this bitumen with lignin would deliver crucial CO₂ savings for the road construction industry.

In June 2021, the world's first test road made from bio-asphalt with Avantium lignin was constructed in the north of the Netherlands. Further details of this project can be found on our [corporate website](#).



Volta Technology

Our fourth proprietary technology, and another member of the Renewable Chemistries family, Volta Technology takes a different approach in our quest for a circular economy. Where our other technologies use plant sources as their raw materials, Volta Technology uses electrochemistry to harness the power of air-based CO₂.

By using carbon from the air, our technology converts a waste GHG into a raw material for a broad range of intermediate and final chemical products, from formic acid and oxalic acid to glyoxylic acid, glycolic acid and fuels.

A Cleaner, Greener Approach

Avantium's cutting-edge electrocatalytic platform unlocks CO₂ as a new carbon source for the chemical industry, enables cleaner processes through its use of electrons as reagents and allows industrial parties to reduce their CO₂ emissions. By not only using up CO₂ that would otherwise contribute to global warming but also making products that would traditionally be made from fossil carbon, Volta Technology means we can set our sights on a circular future sooner.

Going Mobile

As one of the world's most advanced carbon capture and utilisation (CCU) technologies, Volta Technology shows enormous promise. In the short term, our efforts are focused on perfecting our mobile solutions and demonstrating what we can achieve with our electrochemistry technology at several industrial sites in Europe.



Championing CO₂-Based Chemicals and Polyesters

Through the electrochemical reduction of CO₂, Avantium can produce formic acid and oxalic acid, as well as derivatives including glycolic acid. These high-value chemicals have a wide range of applications. PLGA co-polymers containing lactic acid and at least 50% glycolic acid, for example, show enhanced barrier properties

against both oxygen and moisture compared to most other polymers.

In addition, Avantium is developing a new family of proprietary oxalic acid-based polyesters (PISOX) with an unprecedented combination of properties: engineering plastics with outstanding mechanical and thermal properties that are also fully marine degradable, even at low temperatures

in the dark. There are currently no materials on the market offering this combination of properties.

When biogenic (non-fossil) CO₂ is used as the feedstock, these PISOX materials are unique in having a negative carbon footprint. They are therefore able to offset residual emissions and accelerate our quest for net-zero emissions.



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How We Create Value

Avantium creates value by focusing on developing and commercialising technologies to accelerate the transition from fossil-based to renewable and circular plastics. We manage risk and strive to transform our capital resources to create value for the environment, society and our investors.

Our capital lies in the talent and expertise of our employees, our intellectual property (IP) portfolio and innovative processes, our feedstocks and sources, our laboratories and plants, our partnerships with industry leaders and our cash position, grants and investments. Our value creation model shows how our vision, mission and actions create a positive impact on our direct value chain and beyond.

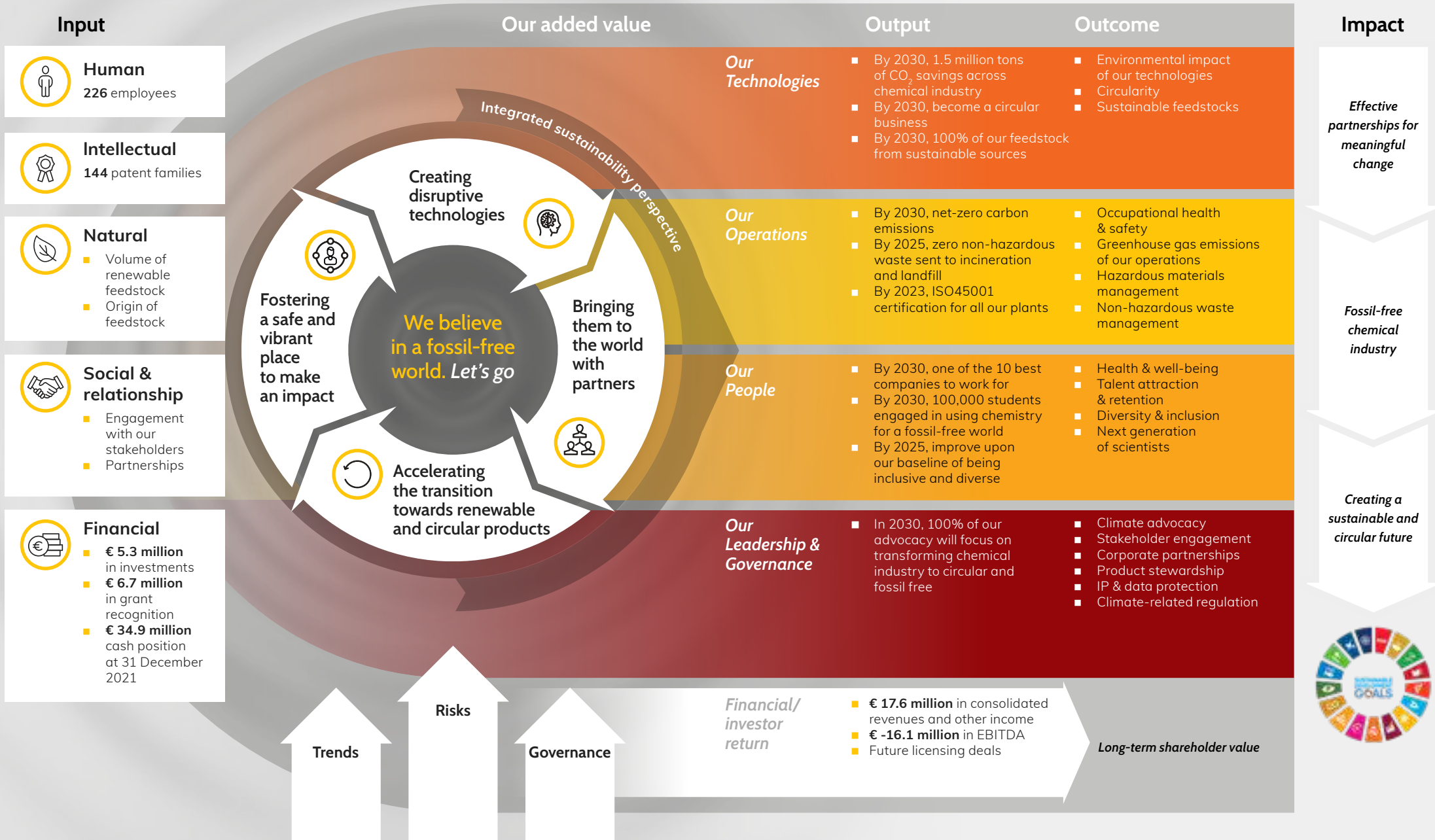


Value Creation Model - Overview





Value Creation Model - Insights



The World Around Us

In 2021, our world continued to adjust to the effects of the pandemic. In times of crisis, there is always a temptation to settle back into old, comfortable habits, but when it comes to global attitudes to resources, consumption and circularity, this pull is one that all of us – from governments, industries and companies to individuals and communities – must resist. This year, even with society still confronting the impact of COVID-19, the world needed a wake-up call.



A Final Warning on Warming

An alarm was sounded in August by the Intergovernmental Panel on Climate Change (IPCC), the

United Nations (UN) body for assessing the science related to climate change. In its Sixth Assessment Report (AR6), the IPCC officially declared, for the first time, that it is 'unequivocal' that human actions – namely greenhouse gas (GHG) emissions – have warmed our land, seas and atmosphere and caused 'widespread and rapid changes', on an unprecedented level, to our environment (see the [IPCC report](#)).

The AR6 warns that warming will exceed a rise of 1.5°C (the limit established under the 2015 Paris Agreement) in the twenty-first century, perhaps even passing 2°C. This will, in turn, significantly affect the planet's climate systems, bringing about even more frequent and

devastating climate events. Announcing a 'code red for humanity', the IPCC suggested that the world needs to roughly halve its emissions over the next decade.

According to the IPCC, reducing human-induced GHG emissions is necessary for limiting global warming to a level to which we could adapt. However, fossil feedstocks, the main culprit for GHG emissions, continue to dominate the energy and material industries. While a general shift towards renewable energy is underway, the materials industry is lagging behind, with the chemicals and plastic sectors especially slow to de-fossilise.

But this could all change with the right solutions. A renewable carbon strategy for the chemicals industry would see manufacturers replacing fossil feedstocks with sources such as glucose or sucrose from plants (as with Avantium's YXY® Technology, Ray Technology™ and Dawn



Technology™) and using carbon from CO₂ to make the products and materials we rely on (as with Volta Technology). With the scientific support for drastic action on emissions stronger than ever, the stage is set for a transformation of the chemicals sector.



Pressure on All Sides

As demand rises, consumer awareness of the plastic problem is also growing. However, concerns usually focus on end-of-life mismanagement of plastic: the part most visible to users. The challenge is to extend these concerns upstream, to fossil feedstocks and unsustainable production (see [MDPI study](#)).

In a [2021 Eurobarometer Survey](#), 58% of respondents said business and industry are responsible for tackling climate change (2020: 51%). But mounting pressure on plastics manufacturers and the wider chemicals industry comes not only from the general public: more governmental regulations, legislation and policies on plastic also took effect in 2021. Please see the Climate-Related Regulation section for details.



Rethinking Packaging

In today's world, plastic is everywhere. There are good reasons for this: it is lightweight, strong, versatile, reliable and cheap to produce. But the world's current 'make, use, dispose' attitude to plastic is unsustainable: we make it recklessly, use it carelessly and dispose of it dangerously.

Our society demands – and produces – plastic in enormous quantities: 367 million tons in 2020. Perhaps more alarmingly, 99% of all plastics are made from fossil sources, accounting for 8–10% of global oil consumption (see [statistics](#)). With forecasts suggesting that demand for plastics will continue to rise, addressing the lack of bio-based feedstocks and the poor circularity of many plastics is one of the most urgent issues facing the plastics industry. It is also one that Avantium is ideally placed to help tackle.

Around [40% of plastic](#) is used for packaging applications, much of it in single-use items that are immediately thrown away. When this waste plastic is non-recyclable, or when it is disposed of irresponsibly, it ends up in landfill or as pollution in our natural environments. It remains there – sometimes for centuries – without properly breaking down, causing harm to wildlife and habitats and infiltrating drinking water supplies. Recyclable, degradable and high-quality plastics for packaging, like Avantium's plant-based PEF, are needed urgently.



Collaborating for Climate Action

The messages from the IPCC and others have clarified the need for urgent action against climate change. The transition to sustainable chemicals and plastics cannot wait, but it requires a coordinated, international and industry-wide commitment. Collaboration has long been central to our strategy, and developments in 2021 suggest that other companies – and countries – are more willing than ever to join forces for more effective climate action.

In February, for instance, a meeting of the UN Environment Assembly (UNEA-5.1) saw the beginning of the [Global Plastics Treaty Dialogues](#). Hundreds of nations and major plastics companies alike have [expressed support](#) for a global, legally binding agreement on plastic pollution. We welcome this step forward and await further progress at the next UNEA session in early 2022.

As technological innovators, however, we know much more work is needed, especially upstream. Plant-based solutions, like PEF made from FDCA and plantMEG™, cannot be overlooked if the chemicals and plastics industry is to successfully decouple from fossil feedstocks.

If 2020 was marked by an unexpected crisis, 2021 was a year in which a long-anticipated one – the global environmental breakdown – became starker and more urgent than ever. Within this challenging landscape, our disruptive technologies, renewable feedstocks and circular products have a valuable role to play. As the world around us takes steps to build back better, Avantium will continue to seize every opportunity to work with like-minded partners, advance our innovative solutions and contribute to a more sustainable future.



Stakeholders and Materiality

It is essential that we maintain an ongoing dialogue with our stakeholders concerning the strategy, developments and activities of Avantium. We define our stakeholders as those individuals, groups or organisations that can affect or be affected by our business. We create value for our stakeholders by working towards our mission to transition the chemical industry to renewable feedstocks and to secure a sustainable future for all. We also work with our ecosystem of strategic, commercial and financial partners, expert suppliers and service providers and academia to drive better results.

Our Stakeholder Groups

We recognise six stakeholder groups: employees; partners and customers; shareholders; suppliers and contractors; governments and authorities; and society. The varied interests and variable expectations of these stakeholder groups determine Avantium's strategy, and each group is affected by Avantium's business activities and performance in a different way.

Employees

Our employees and their talents and motivation are our biggest competitive advantage. We provide a safe and vibrant workplace where everyone can thrive and contribute to our goals. We aim to be a magnet for the best people from a diverse array of backgrounds. Safety is always our number-one priority; we strive for an incident- and accident-free environment.

Partners and Customers

An integral part of Avantium's strategy and commercialisation roadmap is our collaboration with partners throughout the entire value chain. We bring our technologies to the market in collaboration with like-minded companies who complement our skills and knowledge and increase our chances of success.

We bring forward innovative solutions that benefit our customers and help them achieve their sustainability goals. We conduct dialogues with our partners and customers in order to explore common ground for building partnerships and create ecosystems for our innovations around the world. With a global customer base that includes industry leaders, we are well placed to provide tailored services and deliver meaningful results.

Shareholders

Our shareholders rely on Avantium to successfully execute its strategy and create maximum value. By monetising our innovative technologies and bringing our game-changing products to market, we are able to deliver this value to our shareholders, for example through partnerships and licensing. We also develop and capitalise on our extensive intellectual property (IP) portfolio. Our Avantium Catalysis business unit generates revenue and profits by providing extensive service projects and highly advanced catalyst testing systems.

Suppliers and Contractors

Our suppliers and contractors are integral as partners in the efficient and seamless scale-up of our technologies and in delivering on our customer commitments. We are committed to a responsible and sustainable supply chain.

Governments and Authorities

Governments and regulation authorities develop and implement legislation and associated regulations that can significantly affect Avantium. Moreover, European, national and local governments and authorities provide subsidies and grant permits. We therefore engage regularly with these bodies.

Society

Avantium also considers a range of other stakeholders when conducting business. We align our business strategy and sustainability goals with the needs of broader society, looking beyond our direct value chain. We also engage with students at schools and universities, sharing our expertise and exciting the next generation about sustainable and renewable chemistry (for full details, see the Our People section). We have an active dialogue with local communities, industry associations, media and non-governmental organisations (NGOs).



Materiality

Avantium's 2021 materiality assessment identified and prioritised the sustainability topics and issues that are most material to our business and stakeholders, in line with the GRI Standards guidelines, the Sustainability Accounting Standards Board (SASB) and the UN Sustainable Development Goals (SDGs).

Avantium's leadership, colleagues and key internal and external partners (including business partners, NGOs and investors) then rated these topics according to (i) the level of risk and opportunity they present to Avantium's business and (ii) the extent to which they influence our impact on society and the environment. This informed the finalisation and prioritisation of the key topics.

Definitions of Very High Priority Material Topics

Environmental Impact of Our Technologies

Applying Avantium's expertise to improve the efficiency of existing chemical processes and invent new technologies with an improved environmental impact versus fossil-based incumbents.

Greenhouse Gas Emissions of Our Operations

Aligning Avantium's business with a 1.5°C future by reducing carbon emissions in line with the Paris Agreement and working to remove stubborn emissions through credible offsetting.

Circularity

Optimising the recovery, reuse and recycling of our technologies, mitigating Avantium's impact on natural resources.

Sustainable Feedstocks

Using plant-based feedstocks including agricultural crops, residuals from agriculture or forestry or waste material that would otherwise be incinerated.

Occupational Health & Safety

Implementing strong safety management practices, as defined by ISO 45001, in our workplaces to safeguard employees' health.

Health & Well-Being

Ensuring the health and well-being of employees both through our culture and with programmes focusing on work-related stress, work-life balance and mental health.

Talent Attraction & Retention

Attracting, engaging and retaining a productive and talented workforce through programmes, benefits and development opportunities.

Climate Advocacy

Accelerating the industry transition to fossil free by helping our customers and partners embrace the essential technologies and products of tomorrow.

Stakeholder Engagement

Engaging proactively and continuously with various stakeholders in a two-way dialogue, understanding their priorities and reflecting them in our collaboration, advocacy and ESG strategy.

Corporate Partnerships

Selecting partners who share the same values as us and who want to decouple the industry from its reliance on fossil fuels.

IP & Data Protection

Ensuring the protection, confidentiality and ethical use of company, client, employee and supplier data.

Definitions of High Priority Material Topics

Diversity & Inclusion

Upholding the highest standards of equality, fairness and respect among employees by ensuring an inclusive and socially mobile culture with zero tolerance for harassment or discrimination.

Hazardous Materials Management

Reducing or eliminating hazardous materials from our processes wherever possible, and focusing on responsible management and disposal when their use is unavoidable.

Next Generation of Scientists

Promoting and improving STEM education as a way to raise levels of scientific literacy and equip our society to address climate change.

Climate-Related Regulation

Engaging with laws, regulations and restrictions on climate-related topics, from rapidly changing emissions regulations to taxonomy.

Non-Hazardous Waste Management

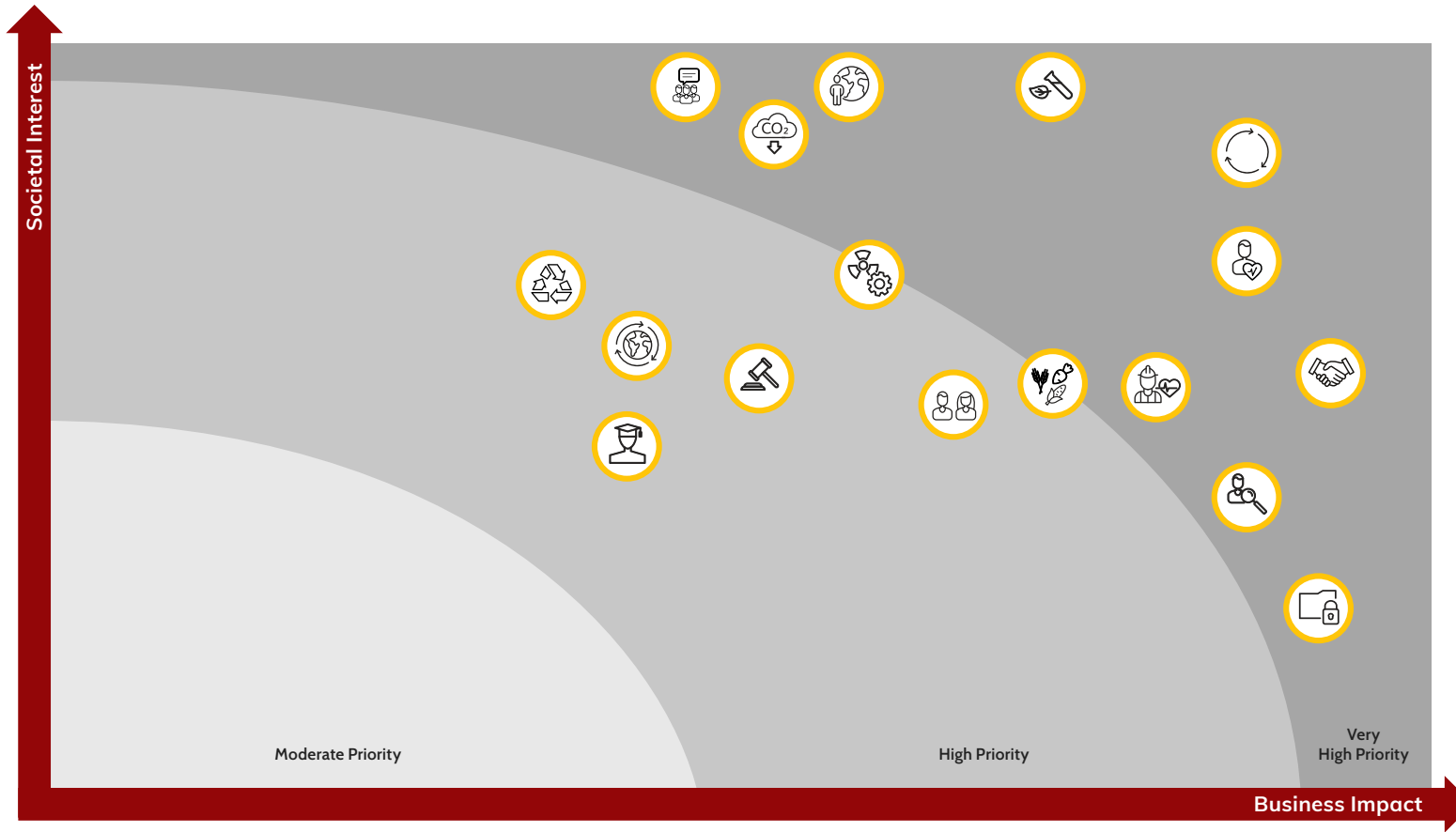
Reducing material use through the adoption of responsible consumption practices and ensuring the highest standards of reuse and recycling across our offices and operations.

Product Stewardship

Managing, in a responsible way, the health, safety and environmental aspects of a product throughout its lifecycle.



Avantium Materiality Assessment 2021



Greenhouse Gas Emissions of Our Operations →	Circularity →	Stakeholder Engagement →	Talent Attraction & Retention →	Sustainable Feedstocks →	Health & Well-Being →
Hazardous Materials Management →	Climate Advocacy →	Product Stewardship →	IP & Data Protection →	Diversity & Inclusion →	Corporate Partnerships →
Environmental Impact of Our Technologies →	Climate-Related Regulation →	Occupational Health & Safety →	Non-Hazardous Waste Management →	Next Generation of Scientists →	



Our Strategy

Avantium's overarching strategy is founded on the four pillars of our mission: creating disruptive technologies, bringing them to the world with partners, accelerating the transition to renewable and circular products and providing a safe and vibrant place to make an impact.

Our goal is to be a world leader in renewable and sustainable chemistry technology solutions and to commercialise them through partnerships and licensing. To achieve this, Avantium's strategy centres on our extensive portfolio of renewable technologies with a focus on sustainable polyesters.

An integral part of Avantium's strategy and our commercialisation roadmap is close collaboration with strong partners throughout the entire value chain. We work with companies who share our values and want to build a better world for future generations. This helps us develop innovative solutions that deliver sustainability benefits to customers and beyond.

Our Business Model

Divesting our technologies to a suitable party

How

Licensing our disruptive technologies to third parties

What

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 both are inspired and inspire each other to work on things that can make a significant positive impact to our collective future.

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.



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 we use this knowledge to bring our technologies to commercial scale.

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 a positive environmental impact.

Applying our technologies in our production plants or through partnerships



Our Business Model

We have multiple strategic routes for monetising our innovative proprietary technologies. These include (i) licensing them to third parties, (ii) applying them in our production plants, partnerships or joint ventures and (iii) divesting them to third parties. Licensing is especially important: as well as being the most capital-efficient way to commercialise our technologies, we believe it is the fastest way to bring our sustainable solutions to market.

Our management processes allow us to manage risk and increase shareholder value. We know we must manage, plan and allocate our resources in the way that best serves all Avantium's stakeholders while enabling us to fulfil our objectives.

Avantium's strategy centres on our extensive portfolio of renewable technologies with a focus on sustainable polyesters.

Our development activities use a stringent stage-gate process to manage the innovation funnel from ideation to business launch, as outlined below. Our strategic aim is to advance our technologies to the point of selling products and licensing our technologies to industrial parties who are expected to build industrial-scale production capacities.

Business Unit Strategies

Avantium Renewable Polymers

Avantium Renewable Polymers is responsible for developing and commercialising YXY[®] Technology, which catalytically converts plant-based sugars into furandicarboxylic acid (FDCA), the main building block of polyethylene furanoate (PEF): a 100% plant-based, fully recyclable plastic material with significant performance benefits and a significantly lower carbon footprint than fossil-based plastics.

The Avantium Renewable Polymers strategy can be broken down into four parts: (i) to continue developing the market for PEF by working with partners to generate global demand, (ii) to prove the technology at commercial scale at our FDCA Flagship Plant, for which we took a positive Final Investment Decision in 2021 and which we aim to make operational in 2024, (iii) to ensure global availability of PEF via technology licences and (iv) to maintain our technology leadership regarding our YXY Technology through ongoing research and key partner collaborations.

Avantium Renewable Chemistries

In Avantium Renewable Chemistries, we aim to develop and commercialise Ray Technology[™], Dawn Technology[™] and Volta Technology.

For Ray Technology, Avantium plans to form a joint venture with Cosun Beet Company. Through this we aim to accelerate the commercial potential of plantMEG[™] and plantMPG[™] and take further steps towards the scale-up to a commercial facility, planned to be operational in 2026. We intend the joint venture to acquire a Ray Technology licence from Avantium. As part of its licensing business model, Avantium will continue to develop and license its Ray Technology globally.

Avantium runs a pilot biorefinery based on Dawn Technology in Delfzijl, the Netherlands, with a focus on operational excellence. We strongly believe in the potential of this technology, which produces industrial sugars from forestry and agricultural residues. We see industrial sugars from Dawn Technology as imperative to a successful future bio-economy. Second-generation, non-food biomass is a viable option for the chemicals industry as it shifts to plant-based sourcing and seeks an extended feedstock portfolio.

As well as creating technologies that use plant-based carbon sources, Avantium aspires to develop materials using carbon dioxide (CO₂) as a feedstock. Our Volta Technology, a carbon capture and utilisation technology, is an electrocatalytic platform that converts CO₂ into chemical building blocks and high-value products. For Volta Technology, the focus is on finding industrial partners that are interested in scaling up first to a pilot plant and then to commercialisation.

Avantium Catalysis

Avantium Catalysis is home to our advanced catalysis research and development and is our revenue-generating business. We aim to maintain our technological leadership in this field as well as to improve cash flows.

Avantium Catalysis also enables customers to develop new catalysts. This not only contributes to sustainability but also provides the R&D methodologies and technologies to support our proprietary technology programmes.



Our Innovation Funnel

Our development activities use a stringent stage-gate process to manage the innovation funnel from ideation to business launch, as outlined below. Our strategic aim is to advance our technologies to the point of selling products and licensing our technologies to industrial parties who are expected to build industrial-scale production capacities.

Innovation Funnel

Avantium's innovation funnel is used to assess and decide on the ideas to pursue as well as to enable the appropriate allocations of resources towards projects at the various phases of development. It consists of six stages.



1 Ideation

In the ideation stage, our chemists and engineers share new developments in a safe and stimulating environment. We use 19 criteria to assess the likelihood of technical and commercial success and we evaluate the strategic fit of the idea for Avantium.

2 Feasibility

The highest-scoring ideas progress to the feasibility stage, where we conduct 'proof of concept' laboratory experiments. We write 'invention disclosures' to accurately and methodically record ideas for further development. We also perform a pre-market analysis and seek external validation.

3 Development

The most promising projects progress to the development stage. Here, we prepare a preliminary business case a budget and an operational plan for the new technology. We also identify partners with whom we could take the technology further. Based on a comprehensive project plan, resources are allocated and the plan is executed.

4 Pilot Plant

In the pilot stage, we develop a pilot plant design. When we have secured financial investment, the new proprietary technology is tested and demonstrated at the pilot plant. Here, we scale up the novel technology from laboratory to demonstration size, further optimise the technology and validate its applications.

5 Flagship Plant

Once successful, we proceed on a stand-alone basis or in partnership to the flagship plant stage, where we begin production at commercial scale. Construction starts once a final investment decision is taken, based on technology and engineering, readiness commercial coverage and financing.

6 Industrial Take-Off

Once the flagship plant is operational and the technology validated, Avantium can license its technology to industrial partners for broader-scale deployment and market adoption.



2021 was a landmark year for Avantium: we took our long-awaited positive Final Investment Decision (FID) on our YXY® Technology and made huge strides towards bringing a new polymer to the market. But progress was not limited to Avantium Renewable Polymers: across all three of our business units, and despite the ongoing challenges of the pandemic, our people worked tirelessly to optimise our technologies and advance our strategy.

Our updated [value creation model](#) shows how we act to bring to life our ultimate vision: a chemicals industry decoupled from fossil feedstocks. It also illustrates how our sustainability ethos is interwoven into every aspect of our work. Through our actions, we aim to create value for all our stakeholders – from employees and investors to partners, customers and society.

In this chapter, we begin by reporting on the highlights of 2021 for each technology area within Avantium. Using the four pillars of our sustainability plan, Chain Reaction 2030, as our compass, we then explore the value we created in 2021 in relation to the topics we have identified as being most material to our business. For more details on this process, see the [Stakeholders and Materiality](#) chapter. We also report on the specific sustainability targets we have set ourselves to achieve by or before 2030.

We are also committed to making a positive contribution to the United Nations Sustainable Development Goals (SDGs), which governments worldwide have adopted with the aim of ending poverty, protecting the planet and ensuring prosperity for all by 2030. Both in this chapter and under Supplementary Information, we report on our SDG contribution in relation to each material topic.

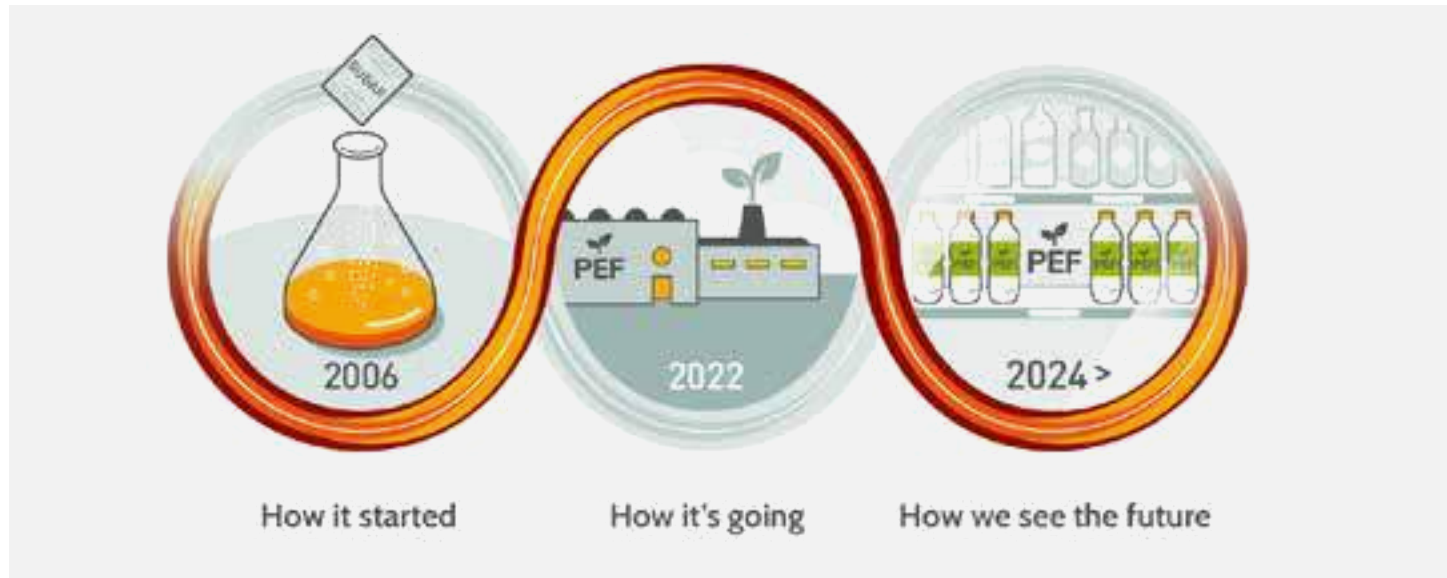
Business Highlights

Each of the technologies within our three business units (Avantium Renewable Polymers, Avantium Renewable Chemistries and Avantium Catalysis) made further strides in 2021 towards its strategic goals.

YXY® Technology

As Avantium's most advanced technology, YXY Technology has always been our central strategic focus, not least because of its potential to revolutionise the plastics industry. In December 2021, our positive FID for the construction of a Flagship Plant rounded off a landmark year. This pivotal moment was the result of many years' hard work, both to optimise our technology and to meet the necessary conditions that we had identified for the positive FID.

At an Extraordinary General Meeting on 25 January 2022, we asked our shareholders for their support of the FID and their approval of several specific related resolutions. The shareholders voted in favour of these resolutions, which enables Avantium to execute all relevant documentation, including but not limited to the investment documentation with the minority shareholders Groningen Consortium and Worley, and the debt financing documentation necessary to complete the transaction



(Financial Close). Consequently, we can begin the scale-up of our operations and build the world's first commercial furandicarboxylic acid (FDCA) factory in Chemie Park Delfzijl (the Netherlands).

As well as generating revenues in its own right, this Flagship Plant will allow us to prove the process technology, demonstrate the commercial applications of the next-generation plastic, polyethylene furanoate (PEF), and to sell technology licences to industrial collaborators. With a capacity of 5,000 tonnes per annum, Avantium's Flagship Plant promises to help realise the potential – and the positive climate impact – of our pioneering YXY Technology.

Making History, Step by Step

The positive FID was subject to fulfilling three key conditions: (i) securing sufficient financing, (ii) obtaining sufficient offtake commitments and (iii) finalising the engineering and establishing the supply chain.

During 2021, Avantium secured a total of €192.5 million to start building the Flagship Plant, subject to Financial Close. This funding comes from a combination of sources: grants, third-party equity, Avantium equity and bank loans. In December, we signed a term sheet for a three-year debt financing package of €90 million with a consortium of lenders: four Dutch banks (€15 million each) and the government-backed Dutch impact investment fund Invest-NL (€30 million).



Securing financial support of this kind is a remarkable feat for an innovative sustainable chemistry company like Avantium, and we believe it is a testament to the enormous potential value of our YXY Technology.

We made good progress in generating conditional offtake commitments for the Flagship Plant. In March and April 2021, we received three new commitments on top of the two agreed in 2020 (all subject to Financial Close and party-specific conditions), taking the total to more than 50% of the Flagship Plant's capacity. Avantium now has contracts (with customary conditions) with specialty chemical company Toyobo (Japan), specialty polyester film producer Terphane (USA), beverage bottling company Refresco (the Netherlands), international rigid packaging supplier Resilux (Belgium) and a major global food and beverage brand. We also signed a collaboration agreement with Carlsberg Group in 2021, relating to the joint development of several PEF applications including Carlsberg's Green Fibre Bottle.

Attracting partners of this calibre reflects the clear potential of FDCA and PEF to break the hold of fossil feedstocks on the packaging sector. We aim to grow this catalogue of international partners and to agree additional offtake commitments, with the aim of selling out the Flagship Plant capacity ahead of its start-up.

We also finalised the engineering and supply chain arrangements for the Flagship Plant in 2021, thus meeting our third key condition for a positive FID. As planned, the front-end engineering and design (FEED) phase was completed by our engineering partner Worley. Avantium then agreed an engineering, procurement and construction contract with Worley in December: with a delivery date at the end of 2023. This contract keeps us on track to commence operations at the Flagship Plant in 2024. We also signed a sub-leasehold agreement with Groningen Seaports for the land on which the plant will be built. In March 2022, the necessary environmental permit from the Groningen environmental authorities became irrevocable.

December 2021 also saw a new strategic partnership agreed in relation to the YXY Technology supply chain. Following the signing of a multi-year FDCA polymerisation contract with specialty polyester supplier Selenis in 2020, Avantium has now secured a long-term agreement with agricultural cooperative Tereos, which will supply high-fructose syrup as a 100% bio-based and local feedstock for the Flagship Plant. This will ensure a stable supply of quality, sustainable materials for use in our processes.

Avantium's Management Team and Supervisory Board have met on a very frequent basis to discuss preparations, developments and progress in relation to the FDCA Flagship Plant. As part of the process of working towards a positive FID, the Avantium Management Team asked the Avantium Technology Board to comprehensively review the technology-related aspects of the project. Following the completion of its in-depth review, the Technology Board shared its observations and positive recommendations with the Management Board and the Industrialisation Committee of the Supervisory Board. Avantium also sought and received external expert advice wherever appropriate and necessary.

After an intense and challenging few years, we were delighted to confirm the positive FID for our Flagship Plant in December 2021. It marks a turning point in Avantium's journey to bring a game-changing new polymer to the market; one that we believe will help the transition to a fossil-free industry, revolutionise value chains worldwide and contribute materially to setting us firmly on the path to a circular economy.

Ray Technology™

Having successfully commissioned Avantium's Ray Technology demonstration plant in 2020, we focused on building on this momentum in 2021 by optimising our processes, bringing new partners on board and completing our life-cycle assessment (LCA; for details, see Environmental Impact of Our Technologies). In this regard, we made several leaps forward towards commercialising our plant-based glycols technology.

In April, we successfully completed the application validation for Ray Technology's plantMEG™ and plantMPG™. Key applications include polymerisation to PEF and polyethylene terephthalate (PET) polyesters and functional fluids used for de-icing and heat transfer. We have now achieved the significant milestone of polymerising Avantium's FDCA with plantMEG to produce 100% plant-based PEF, which stands as further proof of the functional performance of Avantium's plant-based glycols. The creation of a sustainable, fossil-free polyester, ideal for use in valuable textile and packaging applications, marks an important step along the way to the commercial scale-up of Ray Technology.

However, excitement around this progress was countered by a grave reminder of the safety risks inherent in our industry. We reported an accident at our Delfzijl demonstration plant in 2021, from which two colleagues are continuing to recover. We halted Ray Technology operations at the plant while we carried out the necessary investigations and implemented changes to safety procedures and protocols. For full details of the accident and our response, see the Occupational Health & Safety section.



Going Further, Together

We achieved a second key accomplishment in 2021. In April, we announced a new collaboration with our existing Ray Technology feedstock supplier, Cosun Beet Company, a sugar beet processor whose sustainability ambitions fit well with our own. Cosun Beet Company and Avantium signed a term sheet to establish a joint venture to construct a first commercial plant to produce plantMEG and plantMPG using Ray Technology. The term sheet describes the intention and conditions for the joint venture, in which Cosun Beet Company will take a substantial share.

Together, we want to construct and operate the world's first commercial plant for the production of plant-based glycols, which we believe will be operational in 2026. The joint venture plans to acquire a technology licence from Avantium for Ray Technology and aims to establish a long-term supply agreement for the renewable sugar beet feedstock used in our commercial plant. This will further support the fulfilment of our Chain Reaction 2030 target to ensure that 100% of our plant-based feedstocks come from sustainable sources.

This landmark partnership with Cosun Beet Company represents the sugar beet crops of around 9,000 farmers in north-western Europe – but Avantium's ambitions for licensing Ray Technology go much further. We know that we cannot act alone if we are to bring about the fossil-free transition we need, so, in the years to come, we will actively seek out similar deals in different global regions, using local feedstocks.

Dawn Technology™

With our sights firmly set on a circular chemicals industry, Avantium continued working hard in 2021 to develop Dawn Technology at our pilot biorefinery. Chemical processes depend on sugars, and given the global lack of other viable, scaled-up technologies for producing second-generation glucose, Dawn Technology is a highly promising solution for de-fossilising the industry.

In 2021, we de-risked our technology, explored up- and downstream integrations and tested new feedstocks. We also put lignin, a high-value Dawn Technology co-product, to the test in the infrastructure industry.

The Road to Sustainable Construction

Lignin is an organic polymer with exciting sustainability applications separate from those of industrial sugars. In June, infrastructure company (and CHAPLIN XL consortium member) Roelofs built a test section of public road made with bio-asphalt, which uses Dawn Technology lignin to replace fossil-derived bitumen. The new Dawn Drive in Groningen is 250 metres long and contains around 1 tonne of Avantium's lignin.

In 2022, the road will continue to undergo performance and sustainability testing, including an LCA, but preliminary results indicate that lignin-based asphalt has a substantially lower carbon footprint than its fossil-based counterpart. Avantium is proud to be part of this CHAPLIN XL collaboration, which will, if successful, support significant CO₂ reductions in the fossil-heavy infrastructure sector. This short section of test road therefore marks another small but significant step towards our 2030 sustainability target of delivering 1.5 million tonnes of CO₂ savings across our industry.

Volta Technology

In an eventful year for our carbon capture and utilisation (CCU) solution, we made good progress in our on-site Volta Technology projects with partners, won several landmark new grants and refocused our strategy for this key electrochemical technology.

A Better Strategic Fit

In 2021, we decided to revise our plans for this technology in line with our ultimate goal of commercialisation, shifting our focus away from renewable glyoxylic acid towards the upstream conversion of CO₂ to formic acid as well as oxalic acid and glycolic acid. The latter two are key building blocks for polymers and other materials, opening up a much wider range of possible applications. This approach therefore strengthens our business case for Volta Technology. Accordingly, we broadened our intellectual property portfolio by filing six new patents during the year.

Grant Recognition

Continuing Avantium's strong tradition of attracting government funding, we were awarded several significant new grants in 2021 that will help us bring Volta Technology to pilot scale. We believe our ongoing success in grant applications is due recognition of the enormous potential of our technology to create value for our various stakeholders in an efficient and fully scalable way.

In May 2021, we were awarded a total of €1.78 million by the European Union's Horizon 2020 programme for the development of electrochemical processes and CO₂-based polymers. This sum, which will be paid out over a period of four years, covers our participation in three consortia. CATCO₂NVERS, CO₂SMOS and VIVALDI all aim to cut the chemical industry's greenhouse gas (GHG) emissions through innovative and integrated technologies, including electrochemistry platforms such as



Avantium's Volta Technology. This funding will allow us not only to further improve the efficiency of our processes but also to accelerate our growth and strengthen our position at the very forefront of CCU activities in Europe.

Putting Volta Technology to Work

One of our ongoing Horizon 2020 grant projects took important steps forward in 2021. As part of the OCEAN programme, which aims to use CO₂ emitted by power plants to produce oxalic acid (which is the basis for various high-value chemicals), we carried out mechanical and chemical testing on the functionality of a mobile Volta Technology container unit. In January 2022, we installed the unit at an RWE power plant in Germany. During a six-month period, Avantium's will aim to convert 250 g/hour of CO₂ coming directly from a capture facility located at the power plant, into formate.

These pre-pilot containers are an ideal way to test Avantium's Volta Technology in real-world applications. So far, the use of mobile units has shown much promise, and in 2022 we intend to explore the possibility of using such containers all the way up to pilot scale, rather than building a pilot facility. Leasing mobile containers to industry customers means Avantium will benefit from financial revenue at the same time as demonstrating the value of our CCU systems.

Even if the COVID-19 situation kept crucial on-site discussions with partners out of reach in 2021, we nonetheless made notable progress on several potential collaborations. Pandemic restrictions permitting, we aim to finalise new partnerships in 2022. This will allow us to gain traction on Volta Technology's road from development to pilot stage and eventually to commercialisation.

Avantium Catalysis

Avantium supports customers to develop better catalysts and optimise catalytic processes by offering R&D systems and contract R&D. Our products and services are essential to our clients' future. Because catalysts help to make chemical processes more efficient, and reduce waste and unwanted by-products, we contribute not only to our customers' profitability, but also to their transition to sustainability.

Harnessing Remote Systems

Just as in 2020, Avantium Catalysis was hampered in 2021 by the ongoing travel restrictions and site closures caused by the pandemic. Our Flowrence® systems operations were hit particularly hard, with our technicians unable to visit customers' sites to install and commission our proprietary catalysis testing platforms. Nevertheless, in August, we successfully completed our first-ever remote installation and commission of a Flowrence unit via video link. This was a significant challenge and an important achievement, brought about thanks to the ingenuity and hard work of our team. This success opens up more opportunities to support customers efficiently for as long as travel disruption continues, and even beyond.

Avantium Catalysis also had to contend with disruption to the supply chains of key (sub)components and microchips. However, we managed this without a major impact on our operations. Overall, revenue from our Systems business in 2021 amounted to €6.8 million.

Elsewhere, the difficult global context also affected our Refinery Catalyst Testing services. Demand remained low due to oil refineries running at reduced capacity, which meant they did not need to test new catalyst loads. However, overall, our Contract Research business saw the same level of demand as in 2020, and generated €3.2 million in revenue. In 2021, we were able to keep these operations running uninterrupted, in accordance with the Dutch government's COVID-19 guidelines.

New Demand for Sustainable Chemistry

We are pleased to see an increase in questions and requests regarding R&D into sustainable chemistry, which requires tailored solutions. The unique capabilities of Avantium in both chemistry and engineering make us a good partner for such projects. For example, the growth in sustainable chemistry and bio-based products requires more purification of, and separation of contaminants from, product streams. At Avantium Catalysis, we are developing high-throughput solutions for liquid, gas and respiratory adsorption. In 2021, we constructed and delivered a tailor-made testing unit for adsorption to IrceLyon.




In the autumn of 2021, Avantium Catalysis joined the PROVE IT² consortium consortium, which aims to make existing CO₂-to-methanol pathways more efficient and consequently to support the reduction of greenhouse gas emissions within the chemical industry. As part of this three-year project, our Flowrence technology will be used to optimise a proven process for catalytically converting off-gas CO₂ into methanol – another significant contribution towards the circular economy. Avantium Catalysis received €291,000 for its participation in PROVE IT as an innovator in catalytic R&D.



Our Technologies

Avantium is committed to becoming a world leader in sustainable chemistries. In 2021, our array of proprietary technologies continued to make valuable contributions to the future of our planet and its people.

Environmental Impact of Our Technologies

SDG	Subtargets
	9.4: By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes.
	12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimise their adverse impacts on human health and the environment.
	13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

Avantium specialises in accelerated R&D, applying its scientific, R&D and scale-up expertise to improve the efficiency of existing processes and invent new sustainable technologies for the chemicals industry.

Proving the Power of PEF

In 2021, we conducted a full cradle-to-grave life-cycle assessment (LCA) for Avantium's YXY Technology, carried out in partnership with nova-Institut GmbH under the framework of the PEFerence project. The entire life cycle of PEF-based bottles was assessed, from the extraction or cultivation of raw

materials, through production and use, to disposal of the product. All relevant environmental aspects of furandicarboxylic acid (FDCA) and polyethylene furanoate (PEF) production were analysed.

The LCA was performed according to the ISO 14040/14044 standard methodology and was based on the engineering data for the first commercialisation phase of Avantium's technology to produce PEF. A critical peer review of the study was conducted by experts on LCA methodology and incumbent technologies, to verify whether the LCA met the requirements for methodology, data, interpretation and reporting.

Polyethylene terephthalate (PET) bottles were modelled using Ecoinvent data for bottle-grade PET production, available from the most recent Eco-profiles of the European plastics industry. The LCA showed that, compared to fossil-based PET bottle solutions, the use of renewable feedstock (high-fructose syrup from wheat) in PEF results in clear reductions in greenhouse gas (GHG) emissions throughout the entire life cycle.

A second factor in the lower carbon footprint of PEF bottles is the improved barrier and mechanical properties of PEF, enabling a substantial reduction in material usage compared to PET bottles. For monolayer PEF bottles, this results in 33% lower GHG emissions, with a 37% reduction for multilayer PEF/PET bottles.

In addition, as all plants absorb carbon during growth, an inherent advantage of PEF-based products is the temporary storage of CO₂. At the end-of-life of a PEF-based product (i.e. when PEF can no longer be recycled and is incinerated), this biogenic carbon re-enters the natural carbon cycle, whereas end-of-life fossil-based plastics release carbon that had been



locked up in the ground for millions of years, increasing the total amount of carbon in the atmosphere.

This LCA forms the basis for assessing the sustainability benefits of Avantium's current PEF applications. It enables identification and quantification of further technology development, as well as opportunities for improvement in the value chain. Further improvements may consist of the use of renewable energy, different feedstock sources, process optimisation and recycling of PEF. For instance, this LCA took into account the current energy mix in the Netherlands, which still contains a low percentage of renewable energy. It is foreseen that the use of both renewable heat and renewable electricity will become the norm in the near future.

Recent energy optimisation work for an FDCA plant at industrial scale has already shown that energy consumption can be significantly reduced, leading to further improvements to the LCA results. Furthermore, this LCA study still assumes that PEF will initially end up in an open-loop recycling stream with relatively low recycling rates. Sufficient market growth will enable an individual closed-loop material recycling stream with high efficiencies. The PEF process is expected to become much more efficient, in terms of both energy integration and achieved yields. Substantial further GHG emission reductions and other environmental benefits will be achieved when these developments have been realised. Avantium will conduct another LCA study once they have materialised.

More information about the LCA for PEF applications can be found on [Avantium's website](#).

Confirming the Value of Ray Technology

In February 2022, we announced the results of our second LCA: a cradle-to-grave LCA by Sphera (formerly Thinkstep). This study explored the long-term environmental impact of plantMEG from Ray Technology in PET bottles (its most

applicable market) in 2025, with a regional focus on Europe. It compared Avantium's plantMEG production with current incumbent alternative production routes for MEG (using natural gas, naphtha, shale gas and coal feedstock). The LCA shows a GHG emission reduction of up to 83% over the product life cycle when Avantium's plantMEG is used instead of fossil-MEG incumbents.

The plantMEG LCA was conducted according to the guidelines of ISO 14040/14044 and was reviewed by an external critical review panel. It took into account the use of sugar beet from Cosun Beet Company, the production process of Avantium's Ray Technology and the end-of-life stage (when waste materials are recycled, incinerated or landfilled). This study was aligned with European Commission 2025 target-setting for PET and plastic bottle collection and recycling (under the Single-Use Plastics Directive) and used the Circular Footprint Formula for end-of-life allocation.

The life-cycle impacts of plantMEG are sensitive to assumptions about energy sources. For the plantMEG production process, the LCA assumed the use of electricity from wind, green hydrogen based on wind power and thermal energy from natural gas.

The use of renewable feedstocks (sugar beet from Cosun Beet Company) for plantMEG is the main factor in its carbon footprint (574 kg CO₂eq/t), with the thermal energy used to produce plantMEG being the second driver. Compared to fossil-MEG, plantMEG's GHG emissions are between 56% lower (versus MEG made from shale gas) and 83% lower (versus coal-based MEG). PlantMEG performs even better under the so-called substitution approach, which is based on the assumption that recycling into secondary material at the end-of-life will replace an equivalent amount of virgin material. Under this approach, plantMEG scores 72%–89% better than fossil-MEG.

In the above figures, carbon sequestration (the storage of carbon in plants) during biomass growth is not taken into account. This is in line with the international LCA standards and

methods in Europe,³ which do not allow for carbon discounting based on temporary storage.

More information about the plantMEG LCA can be found on the [Avantium's website](#).

The Right Kind of Impact

These ISO-certified LCA results show more clearly than ever that our FDCA and plants-to-glycols technologies are a game-changer for the environmental impact of the chemicals industry. In all kinds of growing markets, from plastic packaging and textiles to aeroplane de-icing and heat-transfer fluids for solar panels, PEF and plantMEG can have a significant positive impact on circularity and product sustainability in a world where consumers' environmental consciousness is also rising.

We will use our LCAs to assess the impact of our technologies as they come to market, tracking the real-world reduction in CO₂ emissions enabled by using YXY Technology and Ray Technology in place of fossil-based processes.

Small Scale, Big Picture

Meanwhile, as the chemicals industry increasingly seeks to reduce waste and energy consumption, the technologies within our Avantium Catalysis business unit will become ever more valuable. Catalysis enables more efficient, and therefore sustainable, chemical processes: catalysed reactions not only need less energy and fewer raw materials, but also create more specific products and reduce unwanted side products and waste. Avantium's Flowrence systems and contract catalysis activities provide a platform for small-scale testing, using minimal quantities of energy and materials. In this way, our solutions greatly improve the sustainability of processes in the chemicals sector and reduce the environmental impact of our customers' operations.



Circularity

SDG Subtargets



9.4: By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.



12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimise their adverse impacts on human health and the environment.

12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.



13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

In our sustainability plan, we pledged to make Avantium a circular business by 2030. In 2021, we took an important step towards this destination by setting up a company-wide circularity workgroup. The group's role is to identify and investigate the various circularity metrics that could be used to assess Avantium's progress on circularity. We will use the workgroup's findings as the basis for our reporting on this material topic in the years to come.

In the meantime, we also continued improving our lead technologies and products, which have been designed to fit seamlessly into the sustainable materials cycle of the future. The design phase is critical to the success of any circular

economy: if products are not specifically developed to be renewable, reusable and recyclable, the circle will inevitably break down.

We have therefore ensured that Avantium's technologies run on plant-based feedstocks whose supply can be renewed, rather than consuming finite resources. As for our products, such as PEF and plantMEG, the LCAs described above provide evidence of their circular credentials regarding recyclability and end-of-life. Our efforts to commercialise our technologies and bring our products to consumers are, by the very nature of these technologies and products, fully aligned with our circularity ambitions.



Sustainable Feedstocks

SDG Subtargets



13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.



15.2: By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.

Securing the sustainable supply of feedstocks is a priority at Avantium. We are committed to ensuring that 100% of our plant-based feedstocks for YXY Technology, Ray Technology, Dawn Technology and Volta Technology will come from sustainable sources by 2030. For us, this means finding suppliers who treat not only the environment but also people – from their employees to their wider society – with respect.

As discussed in the [Business Highlights section](#), Avantium therefore agreed two new partnerships in 2021 with local plant-based feedstock suppliers who demonstrate clear sustainability ambitions: with Tereos (high-fructose syrup) and with Cosun Beet Company (sugar beet), providing renewable feedstocks for our YXY Technology and Ray Technology respectively.

The improved environmental impact enabled by plant-based feedstocks could be further enhanced by a switch to lignocellulosic feedstocks, such as those from second-generation, non-food biomass. Dawn Technology converts this biomass into sugars and lignin, helping to transition the chemical and material industries to non-fossil resources.

Supply Chain Responsibility

Ensuring a green supply chain and logistics set-up is highly material to our work at Avantium. We are therefore diligent about assessing the responsible business credentials of our supply chain and other partners. Throughout 2021, Avantium worked on developing a Supplier Code that incorporates a range of standards to which we expect our suppliers to adhere. The core of this code is based around compliance with national and international regulation and respect for human rights and labour standards, as well as responsible production of bio-based feedstocks. We expect this code to be published in 2022.

Our Operations

Even as we work to support the transition to a de-fossilised chemical industry, we remain conscious of our own operations and their impact on the world around us. In 2021, we set our sights on ambitious sustainability targets and took steps to bolster our safety processes.



Occupational Health & Safety

SDG Subtargets



3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

Safety has always been, and will always be, our number-one priority. Providing safe and healthy working conditions for our people is fundamental – most of all for our colleagues’ well-being, but also for the day-to-day functioning of our business and the fulfilment of our strategy and sustainability goals.

ISO 45001 Certification

We made a commitment in Chain Reaction 2030 to achieve ISO 45001 certification for all Avantium’s plants by 2023. We believe this to be the gold standard for organisations that are serious about improving employee safety, reducing workplace risk and creating better and safer working conditions. ISO 45001 requires an occupational health and safety (OHS) management system, supports organisations’ OHS performance and provides guidance on healthy and safe workplaces.

In 2021, we took steps towards achieving this key sustainability target, working on system governance as well as on document coding, registration and templates. Furthermore, we selected a consultant to help Avantium conduct a gap analysis and develop a detailed implementation plan, including resource planning. We will start implementing ISO 45001 across the entire company in 2022.

Safety Practices and Protocols

As a safety-first company, we have measures to facilitate the ongoing attention and awareness we need to operate in a safe manner. We continued to provide mandatory safety training to new joiners in 2021, and all Avantium employees are also committed to our Golden Safety Rules, which are supported by safety procedures and systems on our sites.

Golden Safety Rules

- We are responsible for 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 stop the activities in unsafe situations and 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.

Avantium company meetings always begin with a safety update, where we discuss incidents and the measures taken to prevent their recurrence. Our Safety Culture Team publishes a quarterly newsletter – ‘We take care of each other’ – to keep everyone’s knowledge up to date. One edition in 2021 focused on how to work from home in a safe manner, in response to the continued requirement for many colleagues to work remotely for parts of 2021. For more details on the measures we are taking to support employees’ health and well-being during COVID-19, see the [Our People section](#) of this chapter.



With some Avantium colleagues switching between on-site and remote working at different times of the year, we recognised the importance of refreshing everybody's safety knowledge and habits. In the summer of 2021, the Safety Culture Team therefore organised a mandatory 'Back to Basics' training course for all employees – whether working in our offices, laboratories or plants. Plenary meetings on risk reduction, colleague behaviours and unplanned events were followed by interactive team dialogue sessions. In these meetings, we refreshed employees' memories about the Golden Safety Rules and also decided to revise one rule: 'We take the time to work in a safe way' has now become 'We stop activities in unsafe situations and take the time to work in a safe way'.

Accidents and Incidents

At Avantium, we strive to be an accident- and incident-free workplace, but we also recognise that the nature of our work in the chemicals industry brings certain risks. We therefore foster a no-blame culture, promoting openness about unwanted events by encouraging employees to report accidents and incidents and allowing us to continuously improve our safety and environmental performance.

In 2021, we recorded 29 incidents (2020: 8). The reason for this increase is that our pilot plant in Geleen has improved the stringency of its reporting mechanisms since 2020. Of the 29 incidents, most were related to breakages or spillages, with the root cause being equipment or behaviour. Nineteen incidents fell under the category Loss of Primary Containment. Three incidents were related to behaviour (a cut to the hand from the sharp edge of a mug, a finger pinched during manual control of a slide valve and a stumble over a doorstep). First aid was needed for two of the incidents.

We also recorded one accident in 2021 (2020: 1). In the first quarter of the year, two experienced operators, wearing full personal protective equipment, were exposed to hazardous vapours as they carried out cleaning activities at the Ray Technology demonstration plant in Delfzijl, and reported health complaints afterwards. The operators remain on sick leave, and they and Avantium continue to focus on recovery and re-integration.

Following the accident, and in accordance with Avantium's protocols, we carried out a root cause analysis that led to the implementation of improvement measures, such as intensifying our efforts to handle hazardous substances safely. We also redesigned certain areas of the demonstration plant, improved our operation instructions and provided additional safety training. During implementation of the improvement measures, we intermittently halted operations at the Ray Technology demonstration plant.

We also initiated a chemical investigation to identify the hazardous vapours. We formed a team including relevant subject-matter experts such as a toxicologist and an occupational hygienist. All required notifications, including to the Dutch Inspectorate for Social Affairs and Employment (Inspectie van Sociale Zaken en Werkgelegenheid), were fulfilled.

In the summer of 2021, we initiated an unknown cause analysis (UCA) with an external facilitator, as the cause of the accident (identification of the hazardous substance) was still unclear. We decided to halt operations at the demonstration plant until the UCA and any follow-up actions were completed.

The UCA showed both that there were extraordinary circumstances during the cleaning activities and that small concentrations of certain hazardous compounds can be formed during the Ray Technology process. Advanced analytical techniques were used to identify these compounds and to assess their toxicity. No environmental impact was identified in connection with the accident.

We subsequently completed the implementation of further process safety measures, including adjustments to the design of the Ray Technology demonstration plant. Avantium also conducted extensive safety assessments and is now in the process of recommencing operations at the demonstration plant.

For a close-knit, safety-first company where such accidents are rare, this occurrence has been hard to come to terms with. The accident has had its impact on the company and the team working in the demonstration plant, making it necessary to restore confidence in the process, installation and organisation and leadership. We therefore took good care, throughout 2021, to be transparent with our colleagues about this event and its consequences, communicating internally about the accident on several occasions: at the plant in Delfzijl, at town hall and company meetings and to the Works Council. Relevant external stakeholders were also kept up to date.



Greenhouse Gas Emissions of Our Operations

SDG Subtargets



7a: By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology.



12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimise their adverse impacts on human health and the environment.

At Avantium, we are conscious of our role as a member of the wider global community and of our duty to play our part in the much-needed transition to net-zero emissions. We are therefore committed to aligning Avantium's business with the 1.5°C future set out by the Paris Agreement. To guide our actions as we reduce our greenhouse gas (GHG) emissions (and offset in a credible way those that remain), we have set ourselves the specific target of achieving net-zero carbon emissions from our own operations by 2030.

This ambition covers both direct GHG emissions from our energy usage (scope 1) and indirect emissions from our activities (scope 2). To reach net zero in Avantium's own operations, we will focus on (i) developing and implementing strategies for GHG reduction and climate resiliency, (ii) lowering our emissions footprint by driving energy efficiency and investment in renewables and (iii) offsetting unavoidable emissions.

In 2021, we worked towards ensuring that all Avantium sites are supplied by renewable electricity. Our pilot plant in Geleen and our site at Amsterdam Science Park were already operating on renewable power, and our Zekeringstraat headquarters in Amsterdam moved to renewable power in January 2022. Our pilot plants in Delfzijl are supplied by the on-site gas-fired combined heat (steam) and power plant.

We also reviewed the way we heat each of our sites. This is a challenging topic for Avantium: our headquarters at Zekeringstraat would need significant structural building work to move away from the current gas boiler system, and our industrial sites are supplied by facilities over which Avantium does not have control. We will continually review the available heating options, and transition to more sustainable approaches if they become available.

As a chemical company, we inevitably produce chemical emissions at each of our sites. We reduce these wherever possible at the experimental design phase, and by using our small-scale Flowrence research technology instead of larger systems wherever possible.

Our Carbon Footprint in 2021

In 2021, we started working on defining how to calculate direct GHG emissions from our Flagship Plant, pilot plants, laboratories and office activities. We decided to draw our utilities emissions factors from www.co2emissiefactoren.nl. This website is managed by Rijkswaterstaat on behalf of the Dutch Ministry of Economic Affairs and Climate.

Our scope 1 emissions footprint covers two areas: direct heating systems (gas boilers) and chemical emissions. For chemical emissions reporting, we will base our methodology on the Kyoto Protocol (as used in GRI-305 methodology), which requires us to look for GHG emissions, ozone-depleting emissions and any other significant substances. Due to our commitment to reach

net-zero carbon emissions, we will also report on our other carbon emissions, converted into CO₂-equivalent.

Our pilot plant sites already measure a range of emissions on an annual basis, covering both CO₂ and other chemicals of interest. Our Zekeringstraat research site (laboratories) will begin annual emissions measurements from 2022. Our Science Park laboratories are leased within a building that hosts multiple scientific companies, and it is not possible to isolate Avantium's emissions from the combined building emissions.

In 2022, we will finalise our scope 1 chemical emissions measurement strategy, as well as ensuring that we have robust, verifiable sources of information for all of our GHG impact factors.

Our scope 2 emissions footprint covers indirect emissions: electricity-related emissions and indirect heating emissions. Our Geleen site already uses electricity from renewable sources and is heated by steam. In 2021, our Zekeringstraat site used electricity from 'grey' power, but has now transitioned to using renewable electricity as of 1 January 2022. Our Delfzijl site is supplied with electricity and heating from a combined-cycle gas turbine plant. In 2022, we will work to find verifiable GHG emission conversion factors for all electricity and heating supplies, allowing us to state a final, confirmed scope 2 emissions value.

Hazardous Materials Management

SDG Subtargets

12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimise their adverse impacts on human health and the environment.

12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and re-use.

As a company operating in the chemicals industry, Avantium handles both hazardous and non-hazardous materials and generates both hazardous and non-hazardous waste.

Avantium has strict guidelines for employees to follow when handling (potentially) hazardous materials. In 2021, we strengthened these guidelines in response to the accident discussed in the Occupational Health & Safety section, and we will continue to look for areas where we can improve our safety practices in 2022 and beyond.

We also take very seriously our duty to handle all waste responsibly, for the sake of our environment and the people in it. We are working towards separating waste streams as much as possible, to enable re-use and recycling rather than incineration.

The nature of Avantium's chemical testing technology, centred around small-scale testing, naturally minimises hazardous waste production. We also enact a safety policy based on the Hierarchy of Control (a system for controlling risks in the workplace), in which our first action is to eliminate the use of hazardous materials whenever possible.

Meanwhile, we recycle hazardous waste residues where we can, and the remainder is sent for incineration. In both cases, we partner with waste experts to ensure the safe disposal of materials that could pose a risk to people or habitats. Often, our partners can recover energy from this waste thanks to thermal processing. In 2021, Avantium produced 107,056 kg of hazardous waste. Please see the table for full details of our management of this waste at our different sites. The tables are included based on input from our waste vendors, but this data is not validated. The data from Delfzijl is not complete, as we have been unable to acquire an accurate breakdown of some waste categories from this site.

Hazardous Waste

in kg	2021	
	Amount	%
Amsterdam (Zekeringstraat and Science Park)		
Incineration with energy recovery	6,718	78%
Re-use or recycling	1,943	22%
Total Amsterdam	8,661	
Pilot plant Geleen		
Incineration with energy recovery	67,773	92%
Re-use or recycling	5,839	8%
Total Geleen	73,612	
Pilot plants Delfzijl		
Incineration with energy recovery	9,958	40%
Re-use or recycling	14,825	60%
Total Delfzijl	24,783	
Total hazardous waste	107,056	

Non-Hazardous Waste Management

SDG Subtargets



12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimise their adverse impacts on human health and the environment.

12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and re-use.

Within Chain Reaction 2030, Avantium has a concrete target related to this important material issue: to send zero non-hazardous waste to incineration and landfill by 2025. In line with this, Avantium already sends zero waste to landfill, and separates paper, glass, metal, wood and construction materials from regular waste for re-use or recycling.

In 2021, the volume of non-hazardous waste produced at our sites was 23,625 kg. The table provides a full site-by-site breakdown of the volume and treatment of our non-hazardous waste in 2021. The tables are included based on input from our waste vendors, but this data is not validated. The data from Delfzijl is not complete, as we have been unable to acquire an accurate breakdown of some waste categories from this site.

Non-Hazardous Waste

in kg	2021	
	Amount	%
Amsterdam (Zekeringstraat and Science Park)		
Incineration with energy recovery	6,228	46%
Re-use or recycling	7,180	54%
Total Amsterdam	13,408	
Pilot plant Geleen		
Incineration with energy recovery	3,252	88%
Re-use or recycling	425	12%
Total Geleen	3,677	
Pilot plants Delfzijl		
Incineration with energy recovery	0	0%
Re-use or recycling	6,540	100%
Total Delfzijl	6,540	
Total hazardous waste	23,625	

To ensure continued progress on this target, in 2022 we will review our non-hazardous waste facilities at each site and optimise the separation of waste wherever possible. We will also work to identify the main contributing factors to our incinerated waste, and create an action plan to reduce these.



Our People

As the driving force behind Avantium’s success, our people are at the heart of everything we do. We believe our mission, strategy and objectives can only be achieved through highly talented, motivated and engaged employees. By fostering a safe, inclusive and inspiring workplace, we attract talented colleagues from diverse backgrounds and create an environment where everyone can reach their full potential.

Our Core Values and Culture

Our employees are guided by five core values that define what we stand for and how we work with colleagues, customers and partners. These core values are not only central to our culture but also enable the execution of our strategy.

1. We make a lasting impact: We think big. We understand our customers through and through. We improve the world around us. We drive – and thrive on – change. We have an impact on the environmental footprint of the wider industry.
2. We are determined team players: We embrace challenges. We value complementary talents and diverse perspectives. We actively engage with partners. We work in teams to solve problems. We go the extra mile to deliver results.
3. We do the right things right: We behave ethically. We make bold choices. We take responsibility for our actions. We operate safely.

4. We are pragmatic idealists: We always find a way. We think outside the box, but never lose sight of reality. We keep our feet on the ground. We always sail towards our destination, adjusting course when necessary.
5. We have fun and the rest of the world is a little bit weird: We disrupt. We appreciate unconventional solutions. We celebrate success and learn from setbacks. We view things with a positive eye and an open mind.

At Avantium, we are united by a common purpose: to make a positive and lasting impact on our world. Our team of 226 people is highly motivated to contribute to our mission to facilitate the transition to a sustainable, fossil-free future.

We do this through our individual and collective imagination, creativity and perseverance. Setting high ambitions and daring to take on big challenges is deeply ingrained in our culture, because we know that innovation is not a linear process but is characterised by highs and lows.

Bringing successful innovation to the market therefore requires persistence, flexibility and focus – traits that are common to Avantium’s people and culture alike. To help us achieve successful innovation, we maintain a flat organisation that empowers colleagues at every level, champions diversity and puts sustainability at the centre of every decision we make.

Our people enable our company to go further and aim higher





Health & Well-Being

SDG Subtargets



3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

The health and well-being of our people are imperative. We recognise that, in order to achieve our goal of a fossil-free industry, we need to foster an environment where all employees feel safe, included and supported – both as people and as the innovators our industry needs. In 2021, we continued to work towards our target of being one of the 10 best companies to work for in the Netherlands by 2030, and to build health and well-being into all areas of our company.

COVID-19

We closely monitored the Dutch COVID-19 guidelines and acted on all government directions as they continued to change throughout the year. As in 2020, we used more stringent hygiene practices to keep people safe in our offices and laboratories.

During periods of remote working, we paid extra attention to the mental and physical health of employees. We continued to supply the equipment and support they needed to carry out their roles safely, comfortably and efficiently, whether at home or in the workplace. This support has included a range of online resources – to help colleagues optimise their physical environment and look after their mental well-being – and a hotline, via Avantium’s healthcare provider, for any employees who require additional help.

We also took steps to maintain social cohesion even at a distance. Bi-monthly company meetings and business unit town

hall meetings were organised virtually. Colleagues also stayed connected through our social intranet, Your Information Platform (YIP), even when they were not able to meet in person. In 2021, a total of 661 messages were posted on YIP by colleagues. Alongside this, Friday night socials and team events took place when COVID-19 restrictions allowed, and we hope to be able to hold more such events in 2022.

The pandemic has clarified the importance of embedding flexible working practices into our company. As restrictions were loosened and re-tightened towards the end of 2021, we held active dialogues between line managers and their teams on future ways of working at Avantium. The majority of employees expressed a clear preference for flexibility and hybrid-working possibilities. We appreciate that finding the right balance of home- and office-working is important, and we will assess this, with a number of internal stakeholders, early in 2022.

Absenteeism

The absenteeism rate in 2021 was 6.1% (2020: 3.8%). Even though 45.1% of all employees recorded no absence due to illness in 2021, the high rate of absenteeism has our full attention. Our social medical team holds regular consultations with our company doctor and involved leadership, with the aim of supporting recovery and reintegration and, as a result, reducing the absenteeism rate due to illness.

Becoming a Top-10 Place to Work

In December 2021, we carried out a Trust Index survey with Great Place to Work, in line with our sustainability target of becoming one of the top 10 places to work in the Netherlands by 2030. In this way, we aim to ensure we provide a dynamic and welcoming workplace for all our people. Our first goals were to identify Avantium’s strengths as an employer and find areas where we can do better – thus establishing a baseline for improvements in the years to come.

With an employee response rate of 82%, this first survey gave Avantium a Great Place to Work Trust Index score of 63%, which means that nearly two-thirds of responses to the Trust Index statements were ‘Often true’ or ‘Almost always true’.

Out of the five dimensions of the Trust Index model, Avantium scored most highly on Camaraderie (72%) and Pride (69%). Camaraderie measures whether employees believe their company is a strong community where colleagues are friendly, supportive and welcoming. Pride measures how employees feel about their own individual impact through their work, their pride in the work of their team and their pride in the company overall.

Within this, Avantium received its highest scores for the following themes:

- People here are treated fairly regardless of their sexual orientation (95%).
- People here are treated fairly regardless of their race (94%).
- I am able to take time off from work when I think it’s necessary (87%).
- People here are treated fairly regardless of their gender (87%).
- I can be myself around here (85%).

Avantium received lower scores for Fairness (63%), Credibility (60%) and Respect (57%). ‘Fairness’ measures (i) whether employees believe management practices and policies are fair and (ii) the equity, impartiality and justice employees experience in the workplace. ‘Credibility’ measures (i) employees’ view on management’s credibility (that is, how believable and trustworthy they are) and (ii) employees’ perceptions of leadership communication practices, competence and integrity. Finally, ‘Respect’ measures (i) the extent to which employees feel respected by leadership and (ii) employees’ perceptions of professional support, collaboration and involvement in decisions, and the level of care leaders show for employees as people.


Specifically, the lowest scores were recorded for the following statements:


- We have special and unique benefits here (18%).
- People here are paid fairly for the work they do (28%).
- I feel I receive a fair share of the profits made by this organisation (33%).
- Management makes its expectations clear (38%).
- I am offered training and/or development to further myself professionally (39%).

Our overall Trust Index score of 63% means Avantium does not yet qualify for Great Place to Work certification. Guided by the survey results, we will define short-, medium- and long-term goals to gain certification and reach Avantium's 2030 target. To this end, a working group of employees from different business units has been established. We aim not only to improve in areas where our employees have asked for more support, but also to challenge ourselves to keep building on areas in which we are already strong. In five years' time, we will repeat the Great Place to Work survey, allowing us to measure our progress against the current baseline.

Talent Attraction & Retention

SDG Subtargets

 5.5: Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life.

 8.2: Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors.

8.5: By 2030, achieve full and productive employment and decent work for all women and men.

We recognise that skilled, imaginative and resilient employees are the key not only to Avantium's continued success but also to our mission of shaping a fossil-free chemical industry. Attracting and retaining the very best people ensures our competitive advantage and remains a central objective for us.

Since innovation is driven by the creative and pioneering minds of our people, we aim to provide everyone with purposeful and fulfilling work within a stimulating and inspiring environment. As well as helping us to attract and retain the high-calibre people our business needs, we see this goal as being deeply embedded in our efforts to reach our sustainability target of becoming one of the 10 best companies to work for in the Netherlands by 2030.

A Magnet for Talent

Fostering a safe and vibrant place where people can make an impact is a key pillar of our strategy. To support and enable this, we offer a number of benefits to our employees, beginning with our remuneration policy. Naturally, recognising and rewarding our people for their work and achievements is an important part of our approach to providing a great place to work. Employee remuneration increases are dependent on performance and results, encouraging our people to aim higher, take on new challenges and make a real, lasting impact through their work. In 2022, ESG-related topics will be included in individuals' performance targets.

Other Avantium employee benefits include company pension contributions and reduced health insurance costs. We also have an Avantium Mobility Plan, which supports greener employee travel through NS Business chip cards for public transport, electric vehicles for management use and a company-wide bicycle scheme, which brings benefits for employees' mental and physical well-being as well as for the environment.

Avantium has a highly educated workforce of experts across a wide range of chemistry and engineering specialisms. In preparation for the next phase of our strategy execution – commercialising our renewable chemistry technologies and constructing our FDCA Flagship Plant – we have broadened our talent pool in terms of expertise in recent years, shifting our focus from competencies such as innovation and creativity towards the skills required for engineering, deployment and commercialisation.

We believe the level of interest shown in Avantium by potential candidates reflects positively on our workplace, in terms of both the work we do and the way we do it. On average, we receive close to 2,000 applications each year – approximately 43 applications per vacancy (2020: 47) – and it usually takes us around 44 days to fill a vacancy. Diversity is a key factor in the depth of our talent pool, and Avantium is proud to attract candidates from all over the world: we currently employ



colleagues representing 20 different nationalities. For further information, see the Diversity & Inclusion section.

As part of our aim to make Avantium an engaging and supportive workplace, we are expanding our range of onboarding activities, including a lunch meeting with leadership in the first few months after they arrive. This will offer new joiners a chance to talk about their transition into the company, and we will use this valuable feedback to keep fine-tuning our talent acquisition procedure.

Training and Development

As well as attracting the best talent for our company, we have a duty to ensure we help all Avantium colleagues reach their full potential, no matter their role in our business. We therefore continued to grow our portfolio of personal and professional training programmes in 2021.

We provide all employees with access to the online training platform GoodHabitx, home to more than 80 personal development programmes. We also have a 'Lead to Grow'

series, which aims to bring leaders in the business together, helping them focus on personal growth, leadership skills and relationship-building. We encourage leaders to work together to solve business challenges, which contributes towards a shared leadership consciousness that thrives at Avantium.

This year, we introduced two new Lead to Grow modules: 'Empathise to Connect' and 'Delegate to Empower'. These modules focus on keeping our colleagues inspired, engaged and connected during a time of uncertainty, and on boosting creativity, initiative and a delivery mindset. Similar to our other programmes in the series, these modules consist of group learning sessions, self-reflection activities and 'fireside chats' with Management Team members, who share their personal stories. Employees are then encouraged to put together personal action plans to help them implement their learnings, supporting their growth and progression at Avantium.

Each of our three business units also has its own development budget to allow its employees to take part in specific training sessions. This encourages our colleagues to stay curious, take ownership of their work and drive their own career paths in the direction they choose.



Diversity & Inclusion

SDG Subtargets



4.4: By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.



5.5: Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life.



8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.

We aspire to be a diverse and inclusive company: a place where everyone belongs, with a safe and open culture where colleagues of all backgrounds feel valued and supported. Our employees may be strongly united by a shared sense of purpose in the work we do, but we believe that, to reach our goals and bring our vision of a fossil-free world to life, fostering and encouraging a diversity of perspectives is fundamental.

Avantium's Chain Reaction 2030 sustainability plan describes a series of sub-targets in this area:

- To refine our diversity and inclusion (D&I) key performance indicators (KPIs), conduct a baseline assessment and establish a plan for improving this baseline;
- To maintain the diversity of nationalities within our company;
- To reach gender equality in leadership positions by 2030.



We are committed to weaving inclusion into the fabric of our business



Strengthening Our Diversity and Inclusion Policy

We have a D&I policy in place, ensuring that we are representative of the societies and communities we operate within.

The fundamental principles of Avantium's D&I policy are: to maintain a balanced workforce composition based on age, gender, cultural or ethnic origin, physical and mental capacity, beliefs and working styles; to provide equal development opportunities for all employees; and to promote a balanced composition in leadership positions through a policy of gender and cultural diversity.

Gender and Background

In 2021, the Avantium workforce was made up of 226 employees of 20 different nationalities. In 2021, women made up 26.1% of our total workforce, versus 24.5% in 2020. This small improvement is nowhere near enough: we pay close attention to our gender balance in an industry where women have historically been severely underrepresented, and we are committed to improving our company's overall gender balance.

Diversity of our Workforce

Site	Number of employees	Of which female	% Full-time contract		% Part-time contract	
			Male	Female	Male	Female
Delfzijl	29	3.4%	82.1%	-	17.9%	100.0%
Geleen	23	-	95.7%	n/a	4.3%	n/a
Science Park	9	22.2%	71.4%	100.0%	28.6%	0.0%
Zekeringstraat	165	33.9%	72.5%	39.3%	27.5%	60.7%
Total	226	26.1%	77.2%	40.7%	22.8%	59.3%

Currently, we have strong female representation on our Supervisory Board: in 2021, four out of its five members were women. At the Extraordinary General Meeting of Shareholders on 25 January 2022, a new male candidate was appointed as a sixth member of the Supervisory Board, complying with the target of at least 30% male or female Supervisory Board members prescribed by Dutch legislation. Nonetheless, we have more work to do at other levels of the company: one of the Management Team's seven members is female, and at the end of 2021, 28% of the Management Team's direct reports in leadership positions were women.

Embedding Inclusion

At Avantium, we know that diversity alone is not enough. We are therefore committed to weaving inclusion into the fabric of our business. To create sustainable change, we recognise that all employees must continue to learn, grow and challenge their perceptions and biases.

In 2021, we developed a comprehensive training programme on unconscious bias, which we will roll out with the aim of a 100% completion rate in 2023. This training will both mitigate the effects of implicit bias in our business and help all colleagues engage meaningfully with this issue.

Ensuring Equal Opportunities

We are committed to providing equal opportunities to our staff, contractors, agents of and applicants to the company, and to not discriminating on the basis of age, gender, race, disability, faith, beliefs or sexual orientation. Avantium aims to ensure that its employees are selected, trained, compensated, promoted or transferred solely on the basis of abilities, qualifications and merit.

Employees who feel they have suffered or witnessed harassment, discrimination, bullying or victimisation, or who struggle with dilemmas in this field, can contact one of our Confidants to address their situation and/or follow Avantium's complaints procedure. The Confidant acts according to our Confidant Regulations, keeping all discussions and information shared strictly confidential and advising the employee under the conditions described in the Confidant Regulations. The following Great Place to Work Trust Index statements will be used to measure how our employees score Avantium on equality over time:

- People here are treated fairly regardless of their age (2021: 81%).
- People here are treated fairly regardless of their race (2021: 94%).
- People here are treated fairly regardless of their gender (2021: 87%).
- People here are treated fairly regardless of their sexual orientation (2021: 95%).
- If I am unfairly treated, I believe I'll be given a fair shake if I appeal (2021: 62%).



Next Generation of Scientists

SDG Subtargets



4.4: By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.

4.7: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.



8.2: Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors.

We use Avantium's scientific expertise to excite the next generation about sustainability and renewable chemistry. In recent years, we have opened our laboratories to students, showcasing sustainable materials and demonstrating how our company works to advance new technologies for a more sustainable future, including the role of polyethylene furanoate (PEF) in the circular economy.

Investing in Our Future

In 2021, we continued these efforts, reaching 2,070 students. Among other activities, we:

- Held an open Weekend of Science to attract young people's attention to the opportunities of innovation and the journey to a fossil-free world.
- Invited a high-school student to take over from CEO Tom van Aken for a day as part of JINC's 'Boss of Tomorrow' programme. The student shared her insights on the question 'How can we make young girls excited about sustainable chemistry?'
- Participated in Imagination at Work, a C3 programme mentoring students through their end-of-year project, with a focus on helping them understand how chemistry and life sciences contribute to sustainability solutions.
- Five students from De Kleine Consultant (the Young Consultant – a non-profit organisation) worked on a 10-week study to identify the market potential of Avantium's PEF in the apparel industry and develop a market entry strategy identifying sustainable brands in the industry. This study was presented to a broader group of students from the Young Consultant organisation.
- Gave an online presentation on Girls Day, aiming to inspire young girls to follow a career in STEM.
- Gave a 'teach-the-teacher' lecture to chemistry teachers as part of a C3 conference with the theme 'Sustainability in chemistry and education'. Teachers then integrated their learnings into their own lessons.
- Hosted Inholland students at Avantium's headquarters for a lecture and laboratory tour.
- Gave a lecture entitled 'Making sustainability work: Successful examples from industry' to students at the University of Leiden.
- Participated in the Da Vinci project, an interdisciplinary honours programme on sustainability for second- and third-year Bachelor's students from Utrecht University. We invited these students to share ideas on, and build a case for, the best ways to deploy Avantium's Volta Technology in industrial settings.

Avantium at the Cutting Edge

To nurture and accelerate innovation, we collaborate and establish partnerships with universities and academic institutes. This gives us access to a large pool of scientists, students and academics, and presents opportunities for scouting new talent for our company.

Our Chief Technology Officer, Gert-Jan Gruter, is Extraordinary Professor of Industrial Sustainable Chemistry at the Van 't Hoff Institute for Molecular Sciences, one of the eight research institutes of the University of Amsterdam's Faculty of Science. He also leads Avantium's Corporate Technologies team, which sits outside our three business units and explores all aspects of polymer materials transitions, acting as an early-stage pipeline of new ideas for existing and future technologies. PhD students form the core of the team, with nine working on their theses at Avantium in 2021 while contributing to the development of our technologies.

Avantium also works with the University of Amsterdam's Psychology Research Institute, where doctoral students in Social Psychology research sustainable consumer behaviour. Investigating the psychology of green consumer habits, such as the public's willingness to pay a premium for greener packaging, is vital if we are to successfully commercialise new sustainable materials and decouple our industry from fossil feedstocks.



Our Leadership and Governance

Avantium has long made its voice heard among the calls for a fossil-free chemical industry. Alongside our actions to bring sustainable, high-performing and commercially viable chemicals and technologies to the world, we are proud advocates for the global transition to sustainable chemical feedstocks. In 2021, we continued to use our position as a leader in this field to have a positive impact on our wider society and create a better future for our planet.

Golden Sustainability Rules

Our approach to sustainability is governed by the following principles. These are our Golden Sustainability Rules, placing our work towards a fossil-free world at the heart of all we do.

	Supporting communities	>	We support and strive to improve the communities in which we operate and live
	Systemic transformation	>	We use our voice to advocate for the systemic transformation needed to tackle the climate breakdown
	Responsibility for environmental impact	>	We develop our technologies and processes with utmost responsibility to their environmental impact
	Progressive partnerships	>	We support progressive partnerships with companies, government agencies, NGOs and academia to develop consistent measurement and make continuous progress
	Dialogue with stakeholders	>	We engage in regular & meaningful dialogue with our stakeholders
	Transparency	>	We are transparent and clear about our technologies and processes
	Supply chain integrity	>	We are committed to supply chain integrity and sustainability excellence
	Better the world	>	We seek to better the world by making a lasting positive impact



Climate Advocacy

SDG Subtargets

- 9.5: Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.
- 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
- 17.6: Enhance regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism.
- 17.7: Promote the development, transfer, dissemination and diffusion of environmentally sound technologies.



Avantium's Chain Reaction 2030 sustainability plan includes the target of ensuring that 100% of our advocacy focuses on transforming the chemicals industry to circular and fossil free. In order to advocate for changes that support the transition to circular and sustainable chemicals and materials, Avantium regularly gives interviews and publishes thought leadership and trade journal articles.

In 2021, Avantium employees gave 26 interviews (including three podcasts) about our technologies and the way they address the climate crisis and plastic waste pollution. We also wrote 17 thought leadership and by-line articles and blogs, advocating for change in the chemicals industry and calling for partnerships and collaborations to tackle the climate crisis. Avantium employees published 17 further articles in peer-reviewed journals and other publications.

We also made our voice heard through digital platforms, especially LinkedIn and Twitter. Moreover, we participated in more than 40 conferences, speaker events and webinars in 2021, giving presentations at more than half of these events.

The scale of the climate crisis challenge demands that we actively engage in and work through partnerships and collaborations. We therefore work with stakeholders across the plastics value chain, for instance in industry associations such as European BioPlastics (EUPB), Biobased Industry Consortium (SME member), Industry Table Northern Netherlands and the Royal Association of the Dutch Chemical Industry (VNCI). Avantium CEO Tom van Aken is the SME representative in the Chemistry Top Team in the Netherlands, aiming to stimulate good cooperation between science, industry and government. Ed de Jong, our Vice President Development, is a board member of the Top Consortium for Knowledge and Innovation for the Biobased Economy (TKI BBE) in the Netherlands, as a representative of the chemicals industry.

In the summer of 2021, Avantium also became a member of the Renewable Carbon Initiative (RCI), an interest group of more than 30 well-known companies active in the chemical and material value chains. The overarching goal of the RCI is to completely replace below-ground fossil carbon with renewable carbon (that is, carbon from all alternative above-ground sources: biomass, CO₂ and recycling). This is the only way for chemicals and materials to become sustainable, circular and climate friendly. The RCI wants to spread this message and initiate further actions by bringing stakeholders together, providing information and shaping policy, in order to support progress towards a climate-neutral circular economy.



Stakeholder Engagement

SDG Subtargets



17.16: Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilise and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries.

Continuous stakeholder engagement, in which we embrace open dialogue and knowledge-sharing, is important in an innovation-driven industry and helps us to identify areas for improvement. We communicate with our stakeholders through various channels and at a variety of levels. The methods of engagement vary depending on the stakeholders, the issues of concern and the purpose of engagement. The following tables provide an overview of our main stakeholder groups, the way we communicate with them and the topics most relevant to them.

The scale of the climate crisis challenge demands that we actively engage in partnerships





How We Engage with Our Stakeholders

Stakeholder	Form and frequency of dialogue	Topics discussed	Effect of dialogue on Avantium
Employees	<ul style="list-style-type: none"> ■ Social intranet (YIP) ■ Company meetings with all employees (every two months or when appropriate) ■ Leadership Team meetings (every two months or when appropriate) ■ Business unit town hall meetings (every two months or when appropriate) ■ Performance reviews (twice a year) ■ Training and development programmes (when appropriate) ■ Works Council (at least every two months or when appropriate) ■ Onboarding programme for new employees (when appropriate) 	<ul style="list-style-type: none"> ■ Strategy ■ Business highlights and performance ■ Health and safety ■ Human Resources-related topics, including vitality ■ Diversity and inclusion ■ Training and development 	<p>With a continuous and open dialogue, we aim to help our employees embrace our values and familiarise themselves with our strategy and mission. We celebrate our successes and share our challenges and setbacks. We believe employee engagement is key to Avantium's business, and that our success is built on the commitment, ambition and expertise of our people.</p>
(Prospective) Partners and customers	<ul style="list-style-type: none"> ■ Business meetings and site visits, joint (research) projects and business development (when appropriate) ■ Phone and video calls, email exchanges and virtual tours by commercial or technical teams (daily) ■ Conferences, symposia and special events (when appropriate) 	<ul style="list-style-type: none"> ■ Technologies, lead products and services ■ Business development and innovation ■ Customer support and quality ■ Technology licences ■ Environmental, social and governance (ESG) targets (e.g. circular business models, carbon footprint) 	<p>An integral part of Avantium's strategy and our commercialisation roadmap is close collaboration with strong partners and customers throughout the entire value chain. We work with companies who share our values and want to build a better world for future generations. This helps us develop innovative solutions that deliver sustainability benefits to customers and beyond.</p>
Shareholders	<ul style="list-style-type: none"> ■ Direct interaction with Investor Relations, CEO or CFO in (video and audio) calls, email exchanges, site visits (daily) ■ Annual General Meeting (annually) ■ Extraordinary General Meeting (when appropriate) ■ Capital Markets Day (Technology & Markets Day/Retail Investors Day) (annually or when appropriate) ■ Annual or half-year results presentation and press release (bi-annually) ■ Investor conferences and roadshows (when appropriate) 	<ul style="list-style-type: none"> ■ Strategy, business activities and performance ■ Financial results ■ Funding options ■ Market outlook ■ Company roadmap and technology portfolio ■ Lead products and end-market ■ ESG performance ■ Board composition and remuneration 	<p>This group consist of current shareholders, potential investors and financial analysts. We aim to help them understand the (long-term) investment opportunities Avantium offers. With shareholders, we discuss our funding strategies and opportunities, financial performance and outlook, as well as our sustainable solutions.</p>



Stakeholder	Form and frequency of dialogue	Topics discussed	Effect of dialogue on Avantium
Suppliers and contractors	<ul style="list-style-type: none"> ■ Direct interaction via supplier account teams/procurement in calls, email exchanges, virtual meetings (daily) ■ Site visits at Avantium and/or at the supplier's office (when appropriate) 	<ul style="list-style-type: none"> ■ Products and technology ■ Innovation ■ Supply chain of renewable feedstock ■ Supplier performance and risk management ■ Health and safety ■ Compliance ■ Human rights and labour standards ■ Environmental topics, including biodiversity ■ IP/information security ■ Business continuity 	<p>We rely heavily on our supplier network. Our suppliers and contractors are integral as partners in the efficient and seamless scale-up of our technologies and in delivering on our customer commitments. We are committed to a responsible and sustainable supply chain.</p>
Governments & Authorities	<ul style="list-style-type: none"> ■ (Pro)active dialogue with government, regulators and authorities and municipalities (when appropriate) ■ Safety and compliance reporting (when appropriate) 	<ul style="list-style-type: none"> ■ Our technologies and lead products ■ Strengthening innovation in the industry and society where we operate ■ Compliance ■ Safety ■ Permitting 	<p>Avantium takes part in open dialogues with relevant governments and authorities. We hold meetings with government bodies, authorities and local municipalities to discuss Avantium's business, opportunities and challenges, with the aim of strengthening our licence to operate and generally promoting an environment conducive to investment and development, as well as to mitigate regulatory and political risk.</p>
Society	<p>Industry associations</p> <ul style="list-style-type: none"> ■ Member conferences, regular meetings, round tables of relevant industry associations (when appropriate) <p>Community, universities, media, NGOs and other</p> <ul style="list-style-type: none"> ■ www.avantium.com (continuously) ■ Avantium's social media channels (continuously/when appropriate) ■ Press releases, interviews, engagement calls/meetings (when appropriate) ■ Collaboration with University of Amsterdam (continuously) ■ Community engagement programmes (when appropriate) ■ Company visits (when appropriate) 	<ul style="list-style-type: none"> ■ Our technologies and lead products ■ Strengthening innovation in the industry, society and where we operate ■ Compliance ■ Circular economy ■ Community engagement ■ Our people ■ Exciting the next generation about renewable chemistry ■ Local developments 	<p>We align our business strategy and sustainability goals with the needs of our wider society, beyond our direct value chain. We also engage with students at schools and universities, sharing our expertise and exciting the next generation about sustainable and renewable chemistry.</p>



Corporate Partnerships

SDG Subtargets



13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.



17.6: Enhance regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism.

17.7: Promote the development, transfer, dissemination and diffusion of environmentally sound technologies.

17.16: Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilise and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries.

Avantium is committed to becoming a world leader in sustainable chemistry – but we also know that by working collaboratively across our industry and beyond, we can make an even bigger impact.

In order to develop, scale and commercialise our YXY Technology, we have built a strong ecosystem of partnerships with multiple players throughout the value chain; from feedstock providers to converters and global consumer brands. One prime example is our collaboration with PEFerence, a consortium of organisations aiming to replace a significant share of fossil-based polyesters with the 100% plant-based PEF; another is the Paper Bottle Project (Paboco®), an innovation community of

leading brands united by their wish to develop a paper bottle. Avantium's PEF will provide the superior barrier properties needed for beverages such as beer and carbonated soft drinks.

For our Ray Technology, we collaborate with partners in consortia such as VEHICLE and IMPRESS. We have also joined forces with Cosun Beet Company, with the aim of establishing a joint venture to convert beet sugar into plantMEG and plantMPG using Ray Technology.

Our Dawn Technology is supported by a consortium consisting of Nouryon, energy company RWE, the Dutch Forestry Agency (Staatsbosbeheer) and Chemport Europe. We also collaborate with partners in consortia such as CHAPLIN XL, VEHICLE and IMPRESS.

Turning to our Volta Technology, we collaborate with more than 35 partners in several EU projects, such as ELCOREL, PERFORM, RECODE, SunCoChem and OCEAN. We jointly perform R&D work to accelerate our progress and reach deployment. Avantium is also a founding member of the industrial association CO₂ Value Europe, where we engage with companies and research institutions who share our belief that carbon capture and utilisation (CCU) technologies are necessary for our circular future.

Meanwhile, our Avantium Catalysis business unit serves the catalysis R&D needs of international blue-chip players, as well as collaborating closely with partners in consortia such as IMPRESS and PROVE IT.



IP & Data Protection

Responsible, active management of our intellectual property (IP) and our data, including that of employees, clients and suppliers, is imperative. We handle our IP portfolio in line with Avantium's strategy and the external IP landscape, and review and decide on the appropriate systems to secure data within our company.

Intellectual Capital

Throughout our innovation process, we record inventions, write invention disclosures and register patents to secure and protect our IP rights – a critical factor in Avantium's success. To safeguard our proprietary technologies and products, we have developed, and continue to maintain and strengthen, an extensive IP position. We consider a patent family fully granted if it is granted in both Europe and the USA.

We further expanded and strengthened our ecosystem of patented technologies in 2021. Additional patent applications were filed on features closely related to the commercial use of our YXY Technology, while a number of valuable patents on PEF applications were granted or filed, both in Europe and in the USA. In order to increase our commercial opportunities, we also lodged oppositions against third-party European patents.

In February 2021, to build on our progress towards establishing the YXY Technology Flagship Plant, Avantium Renewable Polymers signed a patent licence agreement with Eastman Chemical Company, giving us the freedom to operate under its FDCA-related patent portfolio. Under this agreement, we have the flexibility to keep developing our technologies and to work in partnership with Eastman to bring circular innovation to the market.



Further developments in Ray Technology were protected by the filing of several patent applications. Together with the University of Amsterdam, we are also seeking patent protection for new polymers and improved polymerisation methods arising from early-stage research.

The table 'Our Intellectual Capital' gives an overview of our current patents and patent applications, including invention disclosures.

Data Management

In 2021, we embarked on an information technology (IT) improvement programme to make our IT infrastructure and security environment more robust against today's (cyber) challenges. Under the initiative, we migrated Avantium employees to Microsoft 365, replaced company firewalls and launched a Cyber Security Awareness programme, among other things.

This programme consists of a knowledge assessment, computer-based trainings and tests. Based on the assessment results, specific trainings are assigned to relevant target groups, from individual users to all Avantium employees. The training content covers a range of areas – including email phishing, password strength, social engineering, physical security, safe web browsing, travel security and social media – and is adjusted to ever-changing threats. The Cyber Security Awareness programme continues to run in 2022.

In 2021 we did not receive any substantiated complaints concerning breaches of customer privacy or losses of customer data.

Our Intellectual Capital

Business unit	IP portfolio	Current number of patent families (incl. newly filed patent applications) ⁴	Newly filed patent applications in 2021 ⁵	Newly granted patents in Europe (EPO) or the USA in 2021 ⁶	Newly reported inventions in 2021 ⁶
Renewable Polymers	YXY Technology	60	2	8	8
Renewable Chemistries	Ray Technology	16	3	2	6
Renewable Chemistries	Dawn Technology	9	0	1	0
Renewable Chemistries	Volta Technology ⁷	37	1	6	11
Catalysis	Catalysis	11	2	0	10
Corporate Technology	Early stage	11	6	0	4
Total		144	14	17	39

⁴ A patent family is a collection of several national and/or regional patents and/or patent applications covering the same invention.

⁵ A patent application is a request pending at a patent office for the grant of a patent for an invention. Once the patent application complies with the laws of the country or region concerned, a patent may be granted for the invention.

⁶ Newly reported inventions may mature into a publication or patent application or may be kept as a trade secret.

⁷ Including former Liquid Light patent families.

Climate-Related Regulation

SDG Subtargets

- 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
- 17.16: Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilise and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries.

We actively engage with governments and authorities, both as Avantium and through industry associations, to help shape climate policy and plastics regulations. In recent years, regulatory bodies have increasingly focused on the issues of climate breakdown and plastic waste. Through its Green Deal, the EU leads the way on actions for a sustainable economy – with aggressive targets not only for carbon, but also for plastics.

More governmental regulations, legislation and policies on plastic emerged in 2021. In July, for example, the EU banned single-use plastics in 10 common waste items, and the Netherlands expanded its deposit charges on bottles for carbonated soft drinks and water to also cover those with a volume of less than 1 litre. In December, the UN Food and Agriculture Organization called for action to replace conventional polymers with bio-based, bio-degradable polymers. Meanwhile, plastic packaging on many fruits and vegetables is now banned in France, and the United Kingdom has announced a forthcoming tax on all plastic packaging with less than 30% recycled content.

Avantium applauds these regulatory demands on the chemicals and plastics industry as well as on brand owners and retailers. Such actions are forcing companies to make important positive adjustments to their environmental impact.

Product Stewardship

SDG Subtargets

- 12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimise their adverse impacts on human health and the environment.

Avantium is working on a product stewardship plan to be implemented across our entire organisation. This will involve all stages of our product life cycle, from manufacturing to waste.

In 2021, we focused on coordinating our product stewardship with regard to FDCA and PEF products, and made significant progress on product safety documentation and toxicological studies. The developments in our product safety information have been made available to all FDCA and PEF product development partners and transport companies. The safety data sheets are available for all operators to ensure safe handling of the products in all process streams during manufacturing.

The chemical registration of new substances is a critical step to allow chemicals to be produced and/or imported in different jurisdictions. The rules for registration differ from region to region; nevertheless, registration allows a risk assessment on the impact of the substances on human health and the environment to be carried out. Depending on the region, polymers may be exempt from registration, either because the monomers are registered or because the polymer is considered a polymer of low concern. In 2021, Avantium completed the REACH registration for FDCA up to the tonnage band of 1000 ton/year, by completing studies to demonstrate its low toxicity. These studies have been uploaded to the ECHA website. Avantium also completed the polymer exemption of PEF in Korea.

Aerial view of the plot of the planned FDCA Flagship Plant





The authorisation of a material to be used in food contact applications also requires a full assessment of the polymer to ensure consumer safety. In 2021, Avantium developed a resin-grade RP90Nx that is safe to be in direct contact with acetic foods, alcoholic drinks with an alcoholic strength less than 20% and clear and cloudy drinks, compliant with European Regulations.

Responsible Business Principles

Underpinning everything we do at Avantium is our firm commitment to being a responsible business: in terms of both what we do and how we do it. We have numerous principles and policies that guide our work and stand as the bedrock on which we build our success.

Code of Conduct

Our Code of Good Business Conduct covers ethical business practices in a wide range of areas, including (but not limited to) integrity at work, discrimination, working conditions, equal opportunities, conflicts of interest, privacy, financial practices, harassment and bullying and complaints procedures.

In 2021, there were no confirmed incidents of corruption or legal actions on anti-competitive behaviour or anti-trust. There were furthermore no incidents on discrimination reported in 2021.

Golden Safety Rules

We strive to be an accident- and incident-free workplace. All our employees commit to Avantium's Golden Safety Rules, full details of which can be found in the [Our Operations section](#) of this chapter.

Golden Sustainability Rules

Our eight Golden Sustainability Rules have been in place for several years, full details can be found in the Our Leadership and Governance section of this chapter.

Core Values

Avantium aims to uphold five core values, which guide our work to achieve our vision of a fossil-free chemical industry. For more information, see the [Our People section](#) of this chapter.

Oversight and Accountability

Avantium builds progressive partnerships with companies, government agencies, non-governmental organisations and academic institutions to develop consistent measurements and make continuous progress. We also engage in regular and meaningful dialogues with our stakeholders. Our Articles of Association, Supervisory Board Terms of Reference and regulations governing our various committees are available to view [online](#).

Transparency

We are transparent about our technologies, products and processes, and have a number of mechanisms for enabling and ensuring transparency.

- Our Whistleblower Policy sets out the procedures under which employees can and must report relevant irregularities.
- Our Bilateral Contracts Policy covers contact and information-sharing with shareholders.
- We use comprehensive life-cycle assessments (LCAs) to provide transparency about the impact of our products over their whole lifetime. Not only do we feel it is crucial for us to be open about this information to our stakeholders, but we also believe that LCAs should be carried out as standard throughout our industry. More information can be found in the Our Technologies section of this report.

We are transparent about our technologies, products and processes



Financial Performance in 2021

Income Statement

Revenue

in millions of €	2021	2020	% change
Catalysis	10.0	9.2	9%
Renewable Chemistries	0.5	0.4	23%
Renewable Polymers	0.4	0.3	36%
Total revenue	10.9	9.9	11%

Despite the challenges caused by continuing travel restrictions during 2021, revenues in all of the Avantium business segments increased. Avantium Catalysis received several orders for Flowrence® systems and contract R&D projects from companies and academic institutions around the world. As a result, Avantium's consolidated revenues increased by 11% from €9.9 million in 2020 to €10.9 million in 2021.

Other Income: Government Grants

Income from government grants showed a decrease of 20%, from €8.4 million in 2020 to €6.7 million in 2021. The lower grant recognition was predominantly in Avantium Renewable Chemistries and was due to income milestones from two major grant programmes being fully recognised by 2020. The grant income in 2021 is predominantly the result of previously awarded grant programmes (PEference, IMPRESS, Bio-MEG Proeffabriek and DEI+). Avantium successfully secured additional grants in 2021, including grants for participation in the consortia CATCO₂NVERS, CO₂SMOS and VIVALDI.

EBITDA⁸

in millions of €	2021	2020	% change
Catalysis	2.7	2.6	4%
Renewable Chemistries	-2.3	-1.6	44%
Renewable Polymers	-7.1	-7.3	-3%
Company overheads/other	-9.4	-8.6	9%
EBITDA of business segments	(16.1)	(14.9)	8%

In Avantium Catalysis, there was an increase in EBITDA as a result of the higher revenues; this was partially offset by an increase in raw materials and contract costs throughout the year. In Avantium Renewable Chemistries, the EBITDA decreased as a result of the lower income from government grants; this was partially compensated by a delay in costs incurred, due to the accident in the Delfzijl pilot plant, as well as further measures implemented to control costs. The lower EBITDA of Avantium Renewable Polymers was mainly due to an accelerated spending on pre-FID activities. For further information on the EBITDA of Avantium's business segments, please refer to note 19 in the Financial Statements.

Total EBITDA for the group decreased from €-14.9 million in 2020 to €-16.1 million in 2021. The EBITDA for 2020 included a one-off €0.5 million reversal of an onerous lease provision.

Operating Expenses

in millions of €	2021	2020	% change
Raw materials and contract costs	(3.0)	(2.3)	30%
Employee benefit expenses	(19.2)	(19.3)	-1%
Office and housing expenses	(2.0)	(2.0)	—%
Patent, licence, legal and advisory expenses	(4.3)	(4.2)	2%
Laboratory expenses	(2.9)	(3.7)	-22%
Advertising and representation expenses	(0.7)	(0.7)	—%
Reversal due for onerous contract	—	0.5	-100%
Other operating expenses	(1.6)	(1.5)	7%
Net operating expenses	(33.7)	(33.2)	2%

Net operating expenses amounted to €33.7 million in 2021, an increase of €0.5 million compared to 2020 (€33.2 million). This increase is primarily due to the one-off reversal of an onerous lease provision in 2020.

Raw materials and contract costs increased compared to the prior year and are connected to the increase in revenues in 2021. Laboratory expenses decreased compared to prior year, related to the delayed start-up of the Ray demonstration plant in Delfzijl.

⁸EBITDA is an important measure for the company as it measures the financial performance before taking the cost of capital, depreciation and taxes into consideration. EBITDA margins provide a view on the operational efficiency and a more accurate and relevant comparison between peer companies.



Balance Sheet and Financial Position

Avantium's cash position (including restricted cash) was €34.9 million as at 31 December 2021 (31 December 2020: €26.6 million). The increase in Avantium's cash position is due to the successful capital raise that took place in April 2021, raising €27.8 million through an accelerated bookbuild.

The balance sheet total assets increased to €77.7 million (2020: €70.0 million). Total net equity increased to €50.0 million (2020: €46.2 million). The company has no debt or borrowings.

Financial lease obligations increased from €9.7 million in 2020 to €10.7 million in 2021, and primarily consist of lease agreements on offices and laboratory facilities. This increase is due to the extension of a number of lease agreements during the year.

Non-current assets decreased from €34.8 million in 2020 to €34.6 million in 2021, which is primarily as a result of depreciation and limited new capital investments during the year.

Net cash outflow (cash flow excluding capital raise) for the year was €18.1 million, versus €18.8 million in 2020. Avantium's cash outflow therefore improved by €0.7 million compared with the prior year. This was mainly due to improvements in working capital management. Furthermore, Avantium invested €5.3 million in capital expenditure during 2021 (2020: €3.5 million) which primarily related to the investment in the early EPC work and FEED studies for the Flagship Plant by the Avantium Renewable Polymers division.

Avantium's changes in working capital in 2021 amounted to a net positive movement of €3.2 million, compared with €1.2 million in 2020. The 2021 positive working capital movement is the result of €0.5 million lower receivables and €1.4 million higher trade and other payables as the company has accelerated spending in preparation to the Financial Investment Decision.

Cash Outflow

<i>in millions of €</i>	2021	2020	% change
EBITDA	(16.1)	(14.9)	8%
Lease payments	(1.7)	(1.9)	-11%
Working capital movement	3.2	1.2	167%
Capital expenditures	(5.3)	(3.5)	52%
Other ⁹	1.7	0.3	467%
Net cash outflow	(18.1)	(18.8)	-4%

⁹ Other includes non cash movements such share-based payments and onerous contract expenses.



Going Concern

The financial statements have been prepared on a going concern basis.

Avantium N.V. (“Avantium”)

Avantium is a leading technology company in renewable chemistry, dedicated to developing and commercialising breakthrough technologies for the production of chemicals from renewable sources and circular plastic materials.

Avantium consists of the three business segments in various stages of maturity, Avantium Catalysis, Avantium Renewable Polymers and Avantium Renewable Chemistries:

- Avantium Catalysis: Our main revenue generating business unit is Catalysis Services & Systems which serves the R&D catalysis needs of international blue-chip players.
- Avantium Renewable Polymers commercialises its YXY Technology for the production of FDCA (furandicarboxylic acid), which is a key ingredient for PEF (polyethylene furanoate). PEF is a novel 100% plant-based and fully recyclable polymer, which has the potential to outperform today's packaging materials, such as plastic, glass and aluminum. PEF has huge potential in the packaging, film and textile sectors, which are large and growing markets. Avantium Renewable Polymers has operated a pilot plant in Geleen as of 2011 and is planning to build its full scale Flagship Plant at the Groningen SeaPorts site in Groningen. This Flagship Plant will operate at commercial scale and will further support Avantium Renewable Polymers's licensing strategy. We expect that construction of the Flagship Plant for FDCA will start in April 2022 and will be completed by Q4 2023.
- Avantium Renewable Chemistries develops, among other technologies, plantMEG™ (mono-ethylene glycol), which is a plant-based, fully recyclable and competitive alternative for

fossil-based MEG. This is an important chemical building block for PET and PEF resin, both of which are used in bottles and packaging; fibres for clothing, furniture and the automotive industry; and solvents and coolants. Avantium Renewable Chemistries opened a demonstration plant in Delfzijl in 2019, which was successfully commissioned and became fully operational in 2020. Avantium plans to scale-up the plantMEG™ technology in order to subsequently implement its licensing business model.

Funding Avantium

Due to its nature as a technology development company, with significant R&D expenses and negative cash flows over 2021 of €-18.1 million (2020: €-18.8 million) and in the near future, Avantium remains dependent on additional external funding. Fundamental to Avantium's continuity is:

- the construction of the FDCA flagship plant for Avantium Renewable Polymers, for which financing is arranged and for which the Financial Close is planned by April 2022; and
- the funding for Avantium as a group excluding Renewable Polymers which includes further development of Avantium's other technologies. This funding has not been secured yet.

Failure to achieve new funding in a timely fashion may result in the company being unable to fulfil its obligations or to fund capital expenditure and working capital, all of which are necessary to execute the company's strategy, retain contract partners, retain key employees and meet our payment obligations. Without timely funding, the company's going concern is at risk.

These events indicate the existence of a material uncertainty that may cast significant doubt on Avantium's ability to continue as a going concern and therefore, that it may be unable to realise its assets and discharge its liabilities in the normal course of businesses.

In light of the above, management has assessed the going concern assumption on the basis of which Avantium's financial statements for 2021 have been prepared.

FDCA Flagship Plant Business Plan Avantium Renewable Polymers

On 9 December 2021, Avantium announced that it had taken a positive Final Investment Decision (FID) to construct the FDCA Flagship Plant. The positive FID was taken after Avantium fulfilled all three key conditions: (i) obtaining sufficient offtake commitments (ii) finalising the engineering and establishing the supply chain, and (iii) obtaining sufficient financing.

On 9 December 2021, Avantium announced that it signed a detailed term sheet for a three-year debt financing package of €90 million with a consortium of lenders for the financing of the construction (including contingency) and the operational expenses until project completion date of the FDCA Flagship Plant of Avantium Renewable Polymers. The consortium of lenders comprise four Dutch banks; (ABN AMRO Bank, ASN Bank, ING Bank and Rabobank) and the government backed Dutch impact investment fund Invest-NL. Each bank has committed €15 million under the debt financing, and Invest-NL has committed €30 million. The interest over this debt financing is EURIBOR based and is, at today's rates, approximately 8% on an annualized basis over the amounts drawn. With this €90 million debt financing, Avantium Renewable Polymers has now secured (subject to Financial Close) a total of €192.5 million



funding, to be used for capital expenditure, start-up costs and working capital.

The total financing package of €192.5 million includes €27.5 million in grants ("PEference"-EU Horizon 2020 and the National Programme Groningen), €30 million in equity by minority shareholders Groningen consortium and Worley, €90 million in debt financing and an equity investment by Avantium in its subsidiary Avantium Renewable Polymers. Avantium agreed to invest an additional €10 million in equity in Avantium Renewable Polymers in order to absorb the additional costs of one year delay in taking the FID. This increase brings the total committed equity investment by Avantium in its subsidiary Avantium Renewable Polymers to €45 million.

Upon Financial Close, Avantium Renewable Polymers will be fully funded with the goal of becoming cash flow positive upon the start-up and scale-up of the production of FDCA and PEF at the Flagship Plant. All Financial close related agreements (offtake agreements, supply chain contracts, the engineering, procurement and construction contract and financing agreements) are subject to customary terms and conditions and will be effectuated at Financial Close. At the first drawdown of the loan, expected at the end of 2022, several conditions must be met. Avantium expects to successfully reach Financial Close by April 2022 and to fully secure funding for Avantium Renewable Polymers, and is confident that it is on track to meet all conditions and complete all documents required.

Funding Avantium - other technologies

Avantium N.V. cannot use above mentioned financing package, which will be ringfenced financing for Avantium Renewable Polymers, for its other business segments. For this reason, management also assessed its ability to obtain financing for the group's other technologies in order to assess the going concern assumption of the group.

Avantium's consolidated cash position was €34.9 million as at 31 December 2021. As at 31 December 2021, Avantium should still provide €18.5 million to Avantium Renewable Polymers based on the committed €45 million equity funding.

For the group, excluding Avantium Renewable Polymers, the monthly cash spend is forecasted at approximately €1.2 million per month. At Financial Close, which is planned by April 2022, the group excluding Avantium Renewable Polymers and remaining committed equity funding, expects to have a cash balance of approximately €12 million. Based on this assessment, it is management expectation that there is enough cash to fund ongoing operations for a period of approximately 10 months as of the date of these financial statements, therefore additional funding will be required in the course of 2022.

Avantium has received a mandate to raise €45 million in equity capital from its shareholders at the Extraordinary General Meeting of Shareholders held on 25 January 2022.

Although management has not decided on the final transaction structure, it has a preference for a public offering. To that end, management is regularly engaging with existing and potential new investors. Management has also appointed a syndicate of banks to manage the capital raise and the process is already underway. Management is fully focused on the careful planning and execution of all aspects of the proposed capital raise.

There is still however a possibility that recent geopolitical developments or unknown developments result in the capital raise not being successful, partially successful, or that the capital raise cannot be executed in an appropriate timeframe.

In case the capital raise cannot be executed in an appropriate timeframe for the full amount, management is exploring alternatives sources of funding. Avantium is exploring multiple options to strengthen its financial position and evaluate strategic choices to execute its strategy. As such, Avantium is working on attracting additional sources of financing, consisting of a combination of equity and/or government grants to provide for the company's operations beyond 12 months. Furthermore, the company is always exploring possibilities for new grant applications on both a national and on European level in order to (partly) finance its technology development activities.

If the capital raise or the finding of alternative sources of funding are not successful, or materially delayed, this may result in uncertainty with regards to the agreed financing plan for Avantium Renewable Polymers, as the company and the banks, in that case, would not find it prudent to proceed with the debt financing arrangement. In that scenario, the company will have to implement substantial cost savings in both Avantium Renewable Polymers and other businesses to extend the cash run rate.

Based on management's analyses and assessments, although a material uncertainty remains for the company's going concern, management believes it is appropriate to prepare Avantium's financial statements using the going concern assumption.



Investor Relations and Share Performance

Investor Relations

Avantium values its strong relationship with shareholders and the broader investment community. We set high standards for our communications strategy to ensure that we always provide transparent, accurate and relevant information to our shareholders and investors, thereby helping them make informed investment decisions. We are committed to providing high-quality and timely information to all stakeholders, and we ensure that the public market also has access to this information (including price-sensitive data). To that end, Avantium regularly updates the markets on our financial performance, the progress we are making on the execution of our strategy and any other relevant developments in the company, through press releases, webcasts, conference calls and other forms of communication.

To ensure we maintain an open and continuous dialogue with the financial community, we engage with investors extensively through (virtual) roadshows, investor meetings and conferences. We also accommodate meeting requests from the financial community wherever feasible and in adherence with all applicable regulatory and confidentiality obligations.

Our policy is to have at least two representatives of Avantium present at each conversation with shareholders and investors, where possible. Bilateral meetings and conference calls with analysts, investors and shareholders are not held during 'closed periods', which normally start one month prior to the publication of Avantium's annual or half-yearly results. Our policy of holding bilateral meetings with shareholders is set out in the Bilateral Contact Policy that can be found in the corporate governance section of our website.

Dialogue with the Investment Community

We aim to maintain an active and open dialogue with shareholders, investors, research analysts and the rest of the financial community. When we publish our annual and half-yearly results, or when we provide an update on significant strategic events, our CEO and CFO host a conference call for research analysts to discuss our recent business and financial performance. We release transcripts of these calls on our website immediately thereafter. We also use events to inform both retail and institutional investors about our business and strategy.

In 2021, Avantium participated in various investor conferences, organised by Berenberg, Bryan Garnier, Degroof Petercam and ABN AMRO – ODDO BHF, and we also organised various Virtual Management Roadshows to provide insights into our strategy for PEF and plantMEG™. During these digital and physical investor meetings, our CEO, CFO and Investor Relations team engaged with more than 110 UK, US, Benelux and European investors.

General Meetings of Shareholders

On 19 May 2021, our Annual General Meeting of Shareholders (AGM) took place virtually. More information about the meeting, including the minutes, key decisions and attendance, can be found in the corporate governance section of our website.

Capital Raising

In April 2021, Avantium successfully raised €28 million in new capital (or 20% of the existing share capital) through an overnight accelerated bookbuild offering, targeted at existing institutional shareholders and new institutional investors. Pricing of the capital increase was fixed at €5.35 per share, an 8.2% discount versus the previous closing price. The proceeds

from this equity raise were used primarily for our Flagship Plant in Delfzijl, including funding the balance of Avantium's committed €45 million contribution to Avantium Renewable Polymers equity. The remaining part of the net proceeds was used for working capital and other general corporate purposes.

Listing and Indices

Avantium's shares are listed and traded on both Euronext Amsterdam and Euronext Brussels, under the ticker symbol AVTX. In 2021, Avantium was included in the Euronext Amsterdam SmallCap Index (AScX). The AScX consists of the 25 listed companies ranked 51–75 (in terms of size) on Euronext Amsterdam, the Dutch stock exchange.

Share Capital and Voting Rights

At the end of 2021, the number of issued and outstanding ordinary shares amounted to 31,286,447. The ordinary shares issued and outstanding have equal voting rights (one share = one vote).

Indicative Free Float

Avantium's free float amounts to approximately 49%.

Major Shareholders

The Dutch Financial Markets Supervision Act requires Avantium's investors who hold a (potential) capital and/or voting interest of 3% or more to disclose this to the Netherlands Authority for the Financial Markets (AFM). The AFM publishes these major shareholding disclosures in its publicly available register, which can be found at www.afm.nl.

On 15 April 2021, following the capital raise in April 2021, APG Asset Management N.V. notified the AFM that it had increased its shareholding in Avantium to 12.0% (from 9.93%). A few days

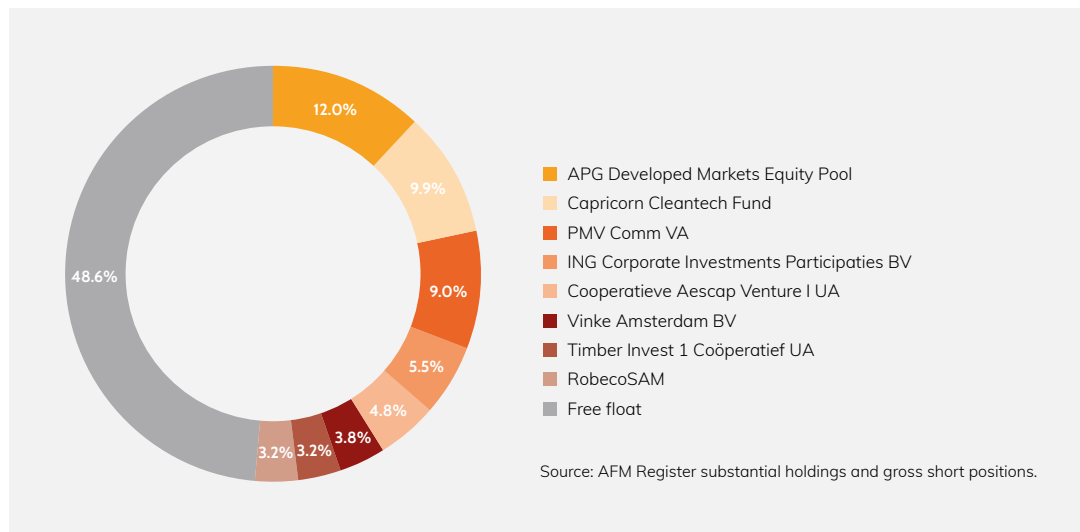


later, on 19 April 2021, Sofinnova Partners reported to the AFM that it had lowered its shareholding in Avantium to 2.47% (from 9.34%). On the same date, Robeco Institutional Asset Management B.V. exceeded the 3% threshold of issued capital and reported a 3.17% shareholding in Avantium. Also on 19 April 2021, Cooperative Aescap Venture I U.A. notified the AFM that it had lowered its shareholding in Avantium to 4.81% (from 6.68%). Finally, on 20 December 2021, John Swire & Sons Ltd reported to the AFM that it had fallen below the 3% threshold of issued capital of Avantium.

In 2021, Avantium continued to have a large shareholder base of Dutch and Belgian retail investors who actively trade the Avantium stock.

A summary of these shareholder percentages (at year-end 2021) can be found in the graph.

Major Shareholders in 2021



Liquidity

The total number of Avantium shares traded in 2021 amounted to circa 24.9 million shares (25.7 million shares in 2020). Velocity (the total number of shares traded divided by the average number of shares issued) was 79.6 % compared to 99.7 % in 2020. Following the successful completion of the €28 million capital raise in April, we witnessed significant trading volumes in April and May of over 100,000 shares traded daily. In December 2021, in response to the 9 December 2021 announcement that the company had taken a Final Investment Decision on the construction of the FDCA Flagship Plant, the Avantium share price substantially increased (a 40% increase on 10 December 2021). In the following weeks, the Avantium stock was traded at high volumes of almost 400,000 shares traded daily.

Dividend Policy

Avantium has not paid dividends since being listed and we do not expect to pay dividends in the foreseeable future.

Share Price Development

Avantium's share price ended the year 2021 at €5.40, under the 2020 closing price of €6.42.

Analyst Recommendations

Five equity analysts currently have research coverage on Avantium (versus four analysts in 2020): ING, KBC, Kepler Cheuvreux, Degroof Petercam and Berenberg.

The research recommendations at the end of 2021 were as follows:

Bank	Target price	Recommendation
ING	€13.44	Buy
Berenberg	€8.40	Buy
Degroof Petercam	€6.00	Buy
Kepler Cheuvreux	€5.00	Hold
KBC	€3.00	Reduce



Risk and Opportunity Management

Framework

Risk management is one of the key responsibilities of Avantium’s Management Team and Supervisory Board. Avantium’s principal risks and uncertainties – whether under our control or not – are highly dynamic and our assessment of and responses to them are critical to the company’s future business and prospects. Avantium’s approach to risk management is framed by the ongoing challenge of understanding the risks that the company is exposed to, the assessment of the company’s risk appetite and how these risks change over time.

This section provides an overview of Avantium’s Risk and Control Framework and its effectiveness, in order to substantiate the Risk and Control Statement.

Risk Appetite

The Management Team determines Avantium’s risk appetite, monitors Avantium’s risk exposure and sets the group-wide targets, which are reviewed on an ongoing basis. This process is supported and supervised by the Supervisory Board. Avantium manages its risks and opportunities through the boundaries defined by the risk appetite. Our risk appetite is broken down into the following risk areas:

Risk areas	Description of risk areas	Appetite
Strategy and Technology	Avantium develops new technologies through R&D projects, which are ‘industry disruptive’. In doing so, Avantium seeks to protect its proprietary technology. We aim to demonstrate scale-up of these technologies from laboratory scale via a pilot plant to a flagship plant, and subsequently to sell technology licences. Funding these technologies is inherently risky.	High
Operations	Avantium’s operational risk is related to managing its laboratories and offices, starting up and operating its pilot plants and building and operating a flagship plant.	Low
Finance and Reporting	Avantium has a conservative financial strategy and strives to ensure that there are no reporting errors.	Low
Legal and Compliance	Avantium strives to avoid non-compliance with laws and regulations, which include health and safety regulations, competition law and environmental laws, and aims to limit any liability risk.	Low



Control Environment

The control environment relates to our standards, processes, culture and structures.

At the top of Avantium, the Management Team sets the tone on the importance of internal risk control by demonstrating its commitment to integrity and ethical values. Avantium's Code of Good Business Conduct supports this open culture.

Avantium is committed to adequate business controls and disciplined processes. Business controls are incorporated into our automated systems as far as possible. The focus of financial reporting is on cash management and bottom-up cash forecasting.

Avantium regularly reviews our insurable risk and our insurance policies together with our insurance broker to determine whether we have sufficient coverage.

Assessments and Audits

The audit function supports Avantium in accomplishing its objectives by providing an independent and professional view on its processes and controls.

The Management Board has decided, in consultation with the Audit Committee, that the company is too small to install its own dedicated internal audit officer. Senior staff members in the company's Finance department are partially dedicated to risk and control management. The CFO oversees risk management tasks. An update on risk management activities, findings, conclusions and actions are provided to the Audit Committee, where priorities are set and guidance is provided to follow up on identified areas of concern and to further enhance risk and control management. This internal audit function is further supported by the relevant subject matter experts throughout the company.

The Technology Board is established and appointed by the Management Board to act in an advisory capacity. The Technology Board provides advice and recommendations to the Management Board regarding technology aspects of major investment decisions, as well as technology strategies the company is pursuing or plans to implement, including risks and risk mitigation strategies.

In January 2021, the Industrialisation Committee of Avantium was established and appointed by the Supervisory Board to serve as its advisory and risk review forum for (i) the company's technology strategy, (ii) its industrialisation roadmaps and (iii) its technology portfolio, all as determined, formulated and executed by the company's Management Board and Management Team.

Professional external operational auditing is brought in on a case-by-case basis. In 2021, external technological, financial and operational auditing was contracted for the scale-up process of YXY® Technology and the related Final Investment Decision to start the construction of the FDCA Flagship Plant. Before taking this investment decision, management carried out an extensive risk assessment.

During the year, Avantium contracted external auditing for information and communication technology (ICT) security. Based on this ICT audit, the company started the ICT Security Project in 2021. The project is focused on technical improvements relating to ICT security and on awareness training for our employees.

In 2021, Avantium also conducted an internal audit on our grant programmes. Grants form an important source of income for Avantium and it is therefore important to ensure that Avantium is compliant with all regulations and controls surrounding these programmes. There were multiple risks identified, but none of these risks was deemed critical. An action plan for areas of improvement has been agreed for the audit issues identified.

In light of the serious environmental situation we face, Avantium has assessed the possible effects of climate change on its financial position. Based on the various positive developments in the groundbreaking technologies we develop (as shared throughout this report), Avantium's management has concluded that climate change does not negatively impact the financial position of the company. On the contrary, climate change may accelerate the demand for alternative renewable materials and provide further opportunities for Avantium.



Risk Assessment

The Management Team, the business units and the functional department heads are responsible for their respective risk management; they perform a risk assessment at least once a year. These assessments are supported and prepared by senior staff members of the Finance department.

These risk assessments identify risks, taking into account the likelihood of risks occurring and the impact on the company, both reputational and financial. Mitigating actions are subsequently defined and monitored. Material conclusions of these assessments are shared with and analysed by the Audit Committee.

Key Risks in 2021

The key risks identified are those that threaten the achievement of Avantium's objectives.

Below is an overview of the key risk factors and mitigating actions. These risk factors are viewed by Avantium's Management Team as being the most relevant. The company has put in place mitigating actions to counter the identified risks, which are categorised as follows: Strategy and Technology; Operations; Finance and Reporting; and Legal and Compliance.



Strategy and Technology

Risks	Mitigating factors
<p>Financing</p> <ul style="list-style-type: none"> Avantium may fail to obtain timely necessary equity, grants or debt funding, thereby preventing the company from continuing as a going concern, violating loan covenants, as well as preventing the company from executing its strategy, delivering on its commitments and obligations towards partners and in grant programmes, retaining key employees and meeting payment obligations. Capital markets are currently very volatile and it is possible that this will make it difficult for Avantium to complete a successful capital raise in the timeframe anticipated. Not meeting certain loan conditions, having major capital expenditure, overspending on operational costs or having major project delays can result in higher funding needs, which can trigger bank guarantees, pledges, sales of assets at depressed prices, capital raises at steep discounts or even bankruptcy. Avantium may not be able to refinance its loans when due at acceptable rates or may be unable to refinance at all. Failure to refinance can trigger bank guarantees, pledges, sales of assets at depressed prices, capital raises at steep discounts or even bankruptcy. Avantium may continue to incur financial losses for the foreseeable future and may never achieve or sustain profitability. 	<ul style="list-style-type: none"> Executing commercial, technical and business plans by strict project management, adequate staffing, project governance and oversight. Actively managing relationships with all relevant stakeholders, including existing shareholders, potential new investors/partners, financial institutions, customers and licensees. Managing cash prudently, without jeopardising strategic progress or compromising the safety of employees or the security of the company's technologies and freedom to operate. Constantly monitoring the national/international grant landscape for new opportunities. Actively monitoring commitments and compliance under grant programmes. Managing portfolios or prioritising scarce resources.
<p>Commercial validation of YXY Technology</p> <ul style="list-style-type: none"> Avantium Renewable Polymers may not be able to commercialise its YXY Technology through the production and sale of its products FDCA and PEF and may not be able to subsequently execute its licensing strategy. This may be due to a variety of factors, including unforeseen operational challenges for which Avantium Renewable Polymers is unable to develop a workable solution, that may result in significant additional costs or that could even prevent production of FDCA at sufficient volumes, in sufficient quality and in accordance with the planned timelines. 	<ul style="list-style-type: none"> Actively managing a sales funnel process targeting and engaging potential and future customers. Implementing a market entrance strategy based on YXY Technology's value propositions in different applications and market segments. In time, when volumes increase and cost price decreases, additional segments become accessible. Selling licences for larger, industrial-scale plants. Due to economies of scale, operational excellence and continuous technology development, cost price will decrease further. Developing a detailed marketing plan for licensing the technology.
<p>Commercialise Ray Technology</p> <ul style="list-style-type: none"> Avantium Renewable Chemistries may not be able to commercialise its Ray Technology through the licensing and subsequent production and sale of plantMEG at the right specifications, quality, yields, cost price and volumes. 	<ul style="list-style-type: none"> Optimising and stabilising Avantium's Ray Technology and the production of plantMEG in the operating pilot plant in Delfzijl, the Netherlands. These activities assist in narrowing down and optimising operational parameters, such as yields and required capital expenditures. Continuing to apply a strict portfolio management and stage-gate approach, to bring projects from ideation, via proof-of-principle, to a fully developed business case that forms the basis for finding like-minded partners and attracting funding. Monitoring competitors' technologies and market entrance strategies for Ray Technology. Maintaining Avantium's strong connections with partners in the plantMEG value chain to de-risk the sourcing of feedstock, operations, financing and commercialisation of plantMEG.



Strategy and Technology (continued)

Risks	Mitigating factors
<p>Realisation of Ray Technology industrial scale factory</p> <ul style="list-style-type: none"> Due to financing (grant and equity), setup of the joint venture and not obtaining sufficient offtake agreements, the Ray Technology industrial scale factory may not be built. Without a factory, Avantium Renewable Chemistries will not be able to sell licences for Ray Technology. A delay in the timeline of setting up the joint venture may cause difficulties in attracting partners. Incorporation of the joint venture may be delayed by factors outside Avantium's control. These factors could include items impacting the business case. 	<ul style="list-style-type: none"> Co-operating with our announced joint venture partner on fine-tuning the business case, site selection and funding. Negotiating offtake agreements with other parties, with a strict portfolio and pipeline approach. Ensuring an organisational focus on the success of this joint venture; sufficient qualified resources to be made available for this key project. Optimising and stabilising Avantium's Ray Technology and the production of plantMEG in the operating pilot plant in Delfzijl, the Netherlands. These activities assist in narrowing down the required capital expenditures. Maintaining Avantium's strong connections with partners in the plantMEG value chain to de-risk the sourcing of feedstock, operations, financing and commercialisation of plantMEG.
<p>Competition</p> <ul style="list-style-type: none"> The technologies Avantium is developing may not be competitive with other new emerging technologies and systems, which provide similar functions, lower cost or better solutions for potential customers. Avantium may not have full oversight of the technologies developed by competitors. 	<ul style="list-style-type: none"> Keeping up continuous technology development to maintain competitiveness. Maintaining strong industry and business partner relationships. Monitoring and analysing competitors through various sources (trade associations, universities, banks, etc.) and their IP filings. Actively maintaining, protecting and expanding our current IP portfolio. Warning potential violators on infringement and the consequences.
<p>COVID-19 and other pandemic scenarios</p> <ul style="list-style-type: none"> Measures including travel restrictions increase the difficulty of closing commercial deals and providing technical services to customers. Potential customers delay decision-making or are less eager to close new deals due to uncertainty in their own business. In the case of an outbreak of COVID-19 in one of our facilities or plants, Avantium might need to fully close down operations, with an impact on technical progress and grant programme milestones. The safety, well-being, engagement and productivity of employees decreases. 	<ul style="list-style-type: none"> Implementing all instructions from, and best practices provided by, government agencies and health officials to reduce COVID-19 infection risks. Coordinating, at Management Team level, all relevant aspects of health, safety, well-being and operations. Organising frequent Management Team town hall and functional meetings via video-conferencing, to keep in close contact with teams and individual employees. Defining a working-from-home policy suitable for the post-pandemic era. Ensuring employees who work from home are supported by appropriate ergonomic tools and infrastructure. Making the HR department and the company doctor available to employees with concerns about physical and mental well-being.



Operations

Risks	Mitigating factors
<p>Construction and operations of FDCA Flagship Plant</p> <ul style="list-style-type: none"> Due to operational, environmental and/or technical reasons, or in the context of geopolitical developments, Avantium Renewable Polymers may not be able to build, start up and operate its Flagship Plant for the production of FDCA on time, in budget and in specification. If construction and commissioning of the FDCA Flagship Plant takes longer than expected, Avantium Renewable Polymers may not be able to meet the demands of (potential) customers, which may hamper and/or delay the commercialisation of FDCA and PEF products. 	<ul style="list-style-type: none"> Ensuring effective and strict project management; supervision, forecasting, risk and cost (spending) control; adequate resourcing including staffing; and quality of the engineering, procurement and construction (EPC) contract. Risk sharing is an important element, as foreseen in the EPC contract. Ensuring, by hiring the appropriate expertise, that the Flagship Plant operates robustly after commissioning, covering all disciplines including staffing, systems, safety, logistics, regulations and finance. Assessing risks: establishing and continuous monitoring an appropriate risk register. Managing construction and operation risks diligently together with constant monitoring of their potential influence on capital and operational expenditure.
<p>Recruit, retain, develop and engage employees</p> <ul style="list-style-type: none"> Avantium may not be able to recruit and/or retain the highly skilled and engaged employees it needs, which will have a direct negative impact on reaching its strategic objectives and may result in business interruptions. 	<ul style="list-style-type: none"> Offering employees competitive compensation, the opportunity to make a direct business impact, autonomy, an inspiring culture and colleagues and a multitude of development opportunities. Using Avantium's sustainability plan, titled Chain Reaction 2030, as a communication instrument for engaging new and existing talents. Initiating learning workshops where people can share knowledge on a variety of topics to promote development. Avantium invests in skill development courses, management trainings and leadership programmes to enable the personal and professional growth of all our employees. Securing equal opportunities and a feel-safe culture.
<p>Intellectual property (IP) protection</p> <ul style="list-style-type: none"> Avantium may not be successful in adequately protecting its proprietary technology, products and processes, information, trade secrets and know-how. 	<ul style="list-style-type: none"> Actively maintaining, protecting and expanding Avantium's IP portfolio in line with the company's IP strategy. Actively monitoring and analysing worldwide trends and technology developments, especially with respect to the patent landscape. Ensuring regular reviews with the technical teams and committees to consider proactively publishing or seeking patent protection. Imposing IP assignment obligations for employees (and – if applicable – consultants, interns and secondees). Maintaining adequate ICT and HR security and IP protection controls. Providing recurring confidentiality and IP protection awareness training to Avantium staff.



Operations (continued)

Risks	Mitigating factors
<p>Freedom to operate</p> <ul style="list-style-type: none"> Avantium may not be able to ensure and maintain its required freedom to operate, and/or Avantium may inadvertently infringe the IP rights of third parties in its commercial operations. Litigation or third-party claims of alleged IP infringement could require substantial time and money to resolve even if proven unfounded. Unfavourable outcomes in these proceedings could limit Avantium in commercialising its lead technologies. 	<ul style="list-style-type: none"> Actively maintaining, protecting and expanding our current IP portfolio, for use, if required, in cross-licensing. Publishing on technologies for which exclusivity is not desired. Actively monitoring and analysing the patent landscape, reviewing competitors' patent portfolios, lodging oppositions and filing third-party observations where appropriate.
<p>Food safety</p> <ul style="list-style-type: none"> Food safety is an important qualifier for many of our future customers. Inability to adhere to food contact materials regulations will negatively affect the company's ultimate ability to sell products for the desired applications and to sell subsequent licences under the company's licensing strategy. Avantium may not be able to obtain the required food contact approvals. 	<ul style="list-style-type: none"> Registering Avantium products in accordance with applicable regulations allowing the manufacture, distribution and use of these products. Co-operating closely with potential customers to ensure appropriate product application testing to support the submissions for food contact approvals. Where possible, the company aims to obtain initial food contact approval with the material produced at pilot-plant phase. Retaining reputable consultants to support the food contact approval submission process in different regions. Following strict manufacturing protocols and quality assurance procedures in future operations to ensure that our products are fully in line with specifications according to regulations and customer needs. Where possible, including liability caps in customer contracts. Establishing product liability insurance to partially cover the risk.
<p>Cybersecurity and ICT</p> <ul style="list-style-type: none"> ICT security risks are changing rapidly. Not keeping ICT infrastructure, systems, procedures and user awareness up to date may result in security risks, business interruptions, information loss or leakage and reporting omissions. 	<ul style="list-style-type: none"> Implementing recommendations on Avantium's ICT infrastructure and security. Regularly updating ICT security and data governance policies. Actively managing compliance with these through preventive, monitoring and detection controls. Providing compulsory training for employees and building their awareness on cybersecurity. Making daily backups of our critical systems/servers and conducting regular restore tests. Keeping hardware, software and firewall solutions and accessibility up to date. Upgrading the enterprise resource planning system (planned as part of the scale-up of Avantium Renewable Polymers and the Flagship Plant project).
<p>Permits and regulations</p> <ul style="list-style-type: none"> Risks such as (i) new or changing regulations, (ii) non-compliance with Avantium's current permits and/or environmental regulations applicable to an Avantium location or company sub-contractors or (iii) unwanted (unintentional) emissions and/or wastewater release. 	<ul style="list-style-type: none"> Regularly engaging with the relevant regulatory bodies and other stakeholders. Diligently and swiftly acting upon observations and recommendations made during inspections by line management, staff, consultants and relevant regulatory bodies.



Operations (continued)

Risks	Mitigating factors
<p>Handling hazardous substances</p> <ul style="list-style-type: none">■ Handling hazardous substances within Avantium's operations brings a risk of spills (environmental damage) and personal exposure (health damage). Inherent health and safety hazards in our operations and insufficient awareness of unsafe plant conditions can lead to injuries or casualties and a (temporary) plant shutdown.	<ul style="list-style-type: none">■ Applying strict design criteria for the factories handling hazardous substances.■ Implementing systems and sensors to detect leakage, formation or presence of chemicals near production installations and laboratories, to provide timely warnings to avoid incidents and accidents.■ Prior to commencing any operational activities, carrying out thorough assessments in which all eventualities are considered, risks are assessed and necessary preventive measures are implemented.■ Maintaining a system to register all (hazardous) chemicals in process streams and inventories.■ Developing advanced analytical techniques to measure the formation or presence of small concentrations of chemicals and assess their toxicity.■ Giving every employee (and student, intern, contractor and consultant) adequate safety training at the start of their engagement as well as a list of all standard operating policies that apply to their relevant activities and locations (laboratory/office/plant), including the proper use of personal protective equipment.■ Creating awareness through training procedures, safety systems, internal memos, instructions and company meetings, as well as a continuous safety culture programme across the company.■ Monthly reporting of all safety incidents and non-conformities to monitor safety performance, maximise learnings, enable follow-up and implement corrective or preventive measures.■ Implementation of an ISO-certified quality programme to promote standard operating procedures and working instructions for day-to-day operations and supervision for safe execution of extraordinary activities (such as maintenance and troubleshooting).■ Working with safety experts, occupational work consultants and toxicologists to assess the hazardous nature of chemicals and find ways to best minimise exposure to hazardous substances, and training employees on how to manage safety risks and avoid exposure to toxic chemicals.
<p>Inflation and rising commodity and energy costs, including due to geopolitical developments</p> <ul style="list-style-type: none">■ Rising costs may result in increased operational and financing costs and may adversely affect Avantium's business.	<ul style="list-style-type: none">■ Management will continue to closely monitor market developments. Through monitoring, the company may better anticipate and assess any impact on the relevant parts of its supply chain and business activities.■ More frequent reviews of the budget and forecasts by management will provide insight on the effect of any increased cost on the company's supply chain and business.■ Continuous review of alternatives for sourcing, actively negotiating applicable terms, (pro-) active and transparent dialogue with business partners, vendors and subcontractors.



Finance and Reporting

Risks	Mitigating factors
Safeguarding Avantium's cash <ul style="list-style-type: none">The banks and/or financial institutions where Avantium deposits its cash may experience disruptions or defaults, leading to a situation where cash is no longer accessible to Avantium.	<ul style="list-style-type: none">Regularly checking the risk profiles of the financial institutions where we have deposited cash.Following the company policy of not speculating with its cash reserves.
IFRS and sustainability compliance <ul style="list-style-type: none">Non-compliance with International Financial Reporting Standards (IFRS) and sustainability reporting requirements. Not informing our shareholders and other stakeholders in conformity with reporting might lead to a loss of trust, reputational damage, a declining share price and, possibly, legal claims.	<ul style="list-style-type: none">Maintaining corporate accounting policies and making them available across the company. Our control framework includes financial reporting controls for compliance with IFRS.Using external expert advice if necessary.Implementing a sustainability reporting roadmap.
Grant reporting <ul style="list-style-type: none">Non-compliance with internal process and external grant rules and regulations may result in a correction (at least) or pay-back of the full amount received (in the worst-case scenario) or missed opportunities under grant programmes.	<ul style="list-style-type: none">Maintaining grant policies and communicating them across the company.Working actively to train employees on internal processes (e.g. time writing) and external regulations, including monitoring compliance on the processes.



Legal and Compliance

Risks	Mitigating factors
<p>New laws and regulations</p> <ul style="list-style-type: none"> New government laws, regulations or measures, including increased regulations on the production and use of sustainable versus oil-based products, may have a major impact on our business and financial position, and could lead to a threat to our activities. 	<ul style="list-style-type: none"> Monitoring and adapting to relevant (changes in) rules and regulations. Maintaining a dialogue with authorities, where possible.
<p>Sanction regulation compliance</p> <ul style="list-style-type: none"> Avantium may unknowingly or unwillingly have partners, customers, agents, consultants or other company contacts in breach of sanctions regulations which could adversely affect our business. 	<ul style="list-style-type: none"> Continuing to adhere to (sanctions) laws and regulations, with Avantium’s policies, procedures and ethics codes prohibiting us from entering into business with sanctioned parties. Using up-to-date sanctions-screening software tools for business relationships the company enters into.
<p>Bribery and corruption</p> <ul style="list-style-type: none"> Avantium may be exposed to bribery and corruption. 	<ul style="list-style-type: none"> Managing a stringent approach to bribery and corruption with internal controls, coordinated by the Finance and Legal teams. Retaining an external, independent organisation to assist, where necessary, in monitoring interactions with suppliers, agents and distributors. Including clauses on anti-bribery, corruption and appropriate remedial actions in many different agreements the company enters into.
<p>Fraud</p> <ul style="list-style-type: none"> Avantium may be subject to fraudulent activities. 	<ul style="list-style-type: none"> Clearly setting the tone at the top that any fraud is not tolerated. Implementing segregation of duties and other internal control activities. Continuous awareness communication and training. Encouraging employees to safely report any suspicion of non-compliance with our ethics code. Following a report, any potential violation will be investigated. The outcome may lead to disciplinary action, the severity of which is determined by the nature and circumstances of the incident. Impacts may include termination of employment. If necessary, the company takes additional action to prevent similar incidents in the future. Using the processes described in the Whistleblower and Confidant policies. Including clauses on fraud and appropriate remedial actions in many different agreements the company enters into.



Legal and Compliance (continued)

Risks	Mitigating factors
<p>Confidential information</p> <ul style="list-style-type: none">An employee or former employee of Avantium or a third party may, intentionally or otherwise, disclose unauthorised confidential information belonging to Avantium, or confidential information received from a customer or business partner.	<ul style="list-style-type: none">Entering into a non-disclosure agreement (NDA) with each employee and where necessary with any third party (such as business partners, customers, suppliers and consultants), to cover the protection of the company's confidential information. In most cases the company NDA template is used (governed by Dutch law).Creating awareness and ensuring that employees understand their confidentiality obligations. Employees are educated during in-house training sessions on the handling of Avantium's confidential information.Making employees aware that it is important to strictly limit the disclosure of Avantium's confidential information only to the particular third parties concerned.Using the standard operating procedure policy stipulating how to handle confidential information (belonging either to Avantium or to a third party).
<p>Compliance with market abuse regulation</p> <ul style="list-style-type: none">Avantium, or a (former) employee of Avantium, may fail to comply with market abuse regulations, and may misuse and/or disclose Avantium's inside information (intentionally or unintentionally).	<ul style="list-style-type: none">Creating employee awareness around adherence to Avantium's insider trading policy and legislation through training programmes and communication.Establishing timely log files on classified information that will likely develop to become inside information.Establishing and maintaining insider lists of Avantium employees who have access to and knowledge of insider information.Having an appropriate meeting schedule (in terms of frequency) for the Disclosure Committee, which reports to the Management Board and Supervisory Board.If applicable, notifying insiders, in a timely manner, about their obligations, creating explicit status acceptance.Disclosing inside information to the market when appropriate.



In-Control Statement

Avantium's assessment is that there are no major failings in its internal risk management and control systems in the reporting year.

It should be noted that the above does not imply that our systems and procedures provide certainty as to the realisation of strategic, operational, compliance and reporting objectives, nor that they can prevent all misstatements, inaccuracies, errors, fraud and non-compliance with laws and regulations.

On this basis, Avantium's Management Board states that to the best of its knowledge:

- the Annual Report provides sufficient insight into the effectiveness of Avantium's internal risk management and control systems;
- the aforementioned risk management and control systems provide reasonable assurance that the financial reporting does not contain any material inaccuracies; and
- based on the current state of affairs, financial reporting on a going concern basis is justified (refer to [going concern note](#)).

In accordance with provision 1.4.3. of the Dutch Corporate Governance Code and Article 5:25c of

the Financial Supervision Act, the Management Board declares that, to the best of its knowledge:

- the sections in the Report of the Management Board as included in this report provide sufficient insights into any deficiencies in the effectiveness of Avantium's internal risk management and control systems;
- the financial reporting systems provide reasonable assurance that Avantium's financial reporting does not contain any material errors;
- based on Avantium's current state of affairs, it is justified that the financial reporting is prepared on a going concern basis (refer to [going concern note](#));
- the sections in the Report of the Management Board list those material risks and uncertainties relevant to expectations regarding Avantium's continuity for the period of 12 months after the preparation of the Report of the Management Board;
- the financial statements as included in this report provide a true and fair view of the assets, liabilities, financial position and results for the financial year of both Avantium and the group companies included in the consolidation; and
- the sections in the Report of the Management Board provide a true and fair view of the situation on the balance sheet date and the business development during the financial year of Avantium and of our affiliated group companies included in the financial statements.

Amsterdam, 22 March 2022

Tom van Aken
Chief Executive Officer

Bart Welten
Chief Financial Officer



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Management Team



Tom van Aken
(1970, Dutch)

Chief Executive Officer (CEO) and member of the Management Board

- Joined Avantium in 2002
- Appointed CEO of Avantium in 2005
- Current term of appointment 2021–2025

Before his appointment as CEO in 2005, Tom van Aken was Avantium's Vice President of Business Development (2002–2004) and Vice President of Global Marketing and Sales (2004–2005).

Prior to joining Avantium, he was Business Development Director at DSM Fine Chemicals, Inc. He earned a master's degree in Chemistry from the University of Utrecht, the Netherlands.



Bart Welten
(1960, Dutch)

Chief Financial Officer (CFO) and member of the Management Board

- Joined Avantium in 2020
- Appointed CFO of Avantium in 2020
- Current term of appointment 2020–2024

Before joining Avantium, Bart Welten served as the CFO of Centrient Pharmaceuticals (formerly a joint venture of DSM and Sinochem) in Singapore. Before leaving Centrient, he oversaw the sale of the company to Bain Capital. Prior to this, he was CFO of DSM Resins and DSM Anti-Infectives. He holds a Law degree from Leiden University (the Netherlands) and an MBA from Boston College (USA).



Gert-Jan Gruter
(1963, Dutch)

Chief Technology Officer (CTO)

- Joined Avantium in 2000
- Appointed CTO of Avantium in 2004

Gert-Jan Gruter has been Avantium's CTO since 2004. Before this, he was responsible for setting up the Chemicals Service Business (2000–2004) and was a Group Leader in New Catalyst Research at DSM (1993–2000).

He is also Professor of Industrial Sustainable Chemistry at the University of Amsterdam, and holds a master's degree in Organic Chemistry and a PhD in Organometallic Chemistry & Catalysis from the Vrije Universiteit (both in the Netherlands). He is the inventor on more than 100 patents and was elected European CTO of 2014.



Carmen Portocarero
(1967, Dutch)

General Counsel

- Joined Avantium in 2012
- Appointed General Counsel in 2012

Carmen Portocarero joined Avantium in 2012. Prior to this, Carmen held various corporate legal positions, including more than 17 years at US telecommunications company AT&T. She holds a master's degree in Law from the Catholic University of Nijmegen (the Netherlands) and completed various law programmes at Harvard University to obtain US qualifications.



Steven Olivier
(1964, Dutch)

Managing Director Avantium Catalysis

- Joined Avantium in 2015
- Appointed Managing Director of Avantium Catalysis in 2015

Steven joined Avantium in 2015 as Managing Director of Avantium's Catalysis business unit. In his role, Steven is responsible for P&L, capital, strategy and overall operations, helping customers in the fields of refining & energy, chemicals and renewables accelerate their catalyst R&D.

Prior to joining Avantium, Steven worked at Albemarle (2005–2014) and at AkzoNobel (1994–2004) in a range of senior executive and commercial roles in the catalyst industry. From 2011 to 2013, he was a representative director of Nippon Ketjen (Japan). He holds a master's degree in Chemistry from Leiden University, the Netherlands.



Bas Blom
(1964, Dutch)

Managing Director Avantium Renewable Polymers

- Joined Avantium in 2021

Prior to joining Avantium, Bas worked for more than 20 years in commercial leadership roles in companies such as GE, SABIC and Renewi.

A Dutch native, Bas has an MSc in Aerospace Engineering from Delft University of Technology, the Netherlands.



Supervisory Board



Edwin Moses
(1954, British)

Chair of the Supervisory Board

- Member of the Supervisory Board since 2019
- Current term of appointment 2019–2023

Background

Edwin Moses is a serial entrepreneur and value creator in European life science companies. He has expertise in high-value service provision to the pharmaceutical industry and in drug discovery and development. His primary focus is on high growth businesses and change management, with 25 years of Board-level experience in more than 15 companies, mostly as Chair.

Responsibilities

Edwin Moses is Chair of the Supervisory Board, Chair of the Nomination Committee, Chair of the Remuneration Committee and a member of the Audit Committee.



Cynthia Arnold
(1957, American)

- Member of the Supervisory Board since 2020
- Current term of appointment 2020–2024

Background

Cynthia Arnold served as Senior Vice President and CTO at The Valspar Corporation and was also CTO at Sun Chemical Corporation. Prior to this, she worked for nine years at General Electric Plastics, including three years at GE Plastics Europe in the Netherlands. She holds a PhD from the Virginia Polytechnic Institute & State University in Blacksburg (USA), as well as both an MBA and a BS in Chemical Engineering from the University of California in Berkeley (USA).

Responsibilities

Cynthia Arnold is Chair of the Industrialisation Committee and a member of the Nomination Committee and of the Remuneration Committee.



Michelle Jou
(1969, Taiwanese)

- Member of the Supervisory Board since 2020
- Current term of appointment 2020–2024

Background

Michelle Jou worked for around 19 years at Covestro (formerly Bayer Material Science) in various senior management positions in Asia and Europe. In her last role at Covestro, she was President of Covestro's global Polycarbonates Segment (Shanghai). She holds a BA in French from Fu-Jen University (Taiwan) and an MBA from the EMLYON Business School (France).

Responsibilities

Michelle Jou is a member of the Nomination Committee, of the Remuneration Committee and of the Industrialisation Committee.



Margret Kleinsman
(1963, Dutch)

- Member of the Supervisory Board since 2017
- Current term of appointment 2021 - 2025

Background

Margret Kleinsman, CFO of Agrifirm, graduated from the University of Twente and completed her post-doctoral research at the Vrije Universiteit in Amsterdam (both in the Netherlands). She was CFO of Holland Colours N.V. from 2014 until 2020. Before this, she worked for AkzoNobel, with particular responsibilities in the areas of chemicals, fibres and coatings, and including two longer-term assignments in the USA.

Responsibilities

Margret Kleinsman is Chair of the Audit Committee.



Trudy Schoolenberg
(1958, Dutch)

- Member of the Supervisory Board since 2020
- Current term of appointment 2020–2024

Background

Trudy Schoolenberg served in various senior management positions at Shell, Wartsila and AkzoNobel in research, operations and strategy. She has a PhD in Technical Sciences and an MSc in Industrial Engineering from the Delft University of Technology (the Netherlands). She is certified as a Non-Executive Director at ESAA, Erasmus University Rotterdam.

Responsibilities

Trudy Schoolenberg is a member of the Audit Committee and of the Industrialisation Committee.



Report of the Supervisory Board

Introduction

This report explains how Avantium’s Supervisory Board fulfilled its responsibilities in 2021. The Report of the Supervisory Board should be read in conjunction with the [Corporate Governance section](#), which provides information on the company’s corporate governance structure.

Composition, Diversity and Independence

The Supervisory Board currently consists of five members: Edwin Moses (Chair), Cynthia Arnold, Michelle Jou, Margret Kleinsman and Trudy Schoolenberg. The biographies of the Supervisory Board members are available on the preceding pages of this report and on the Avantium website.

In August 2021, the Supervisory Board proposed the appointment of Mr Nils Björkman as a sixth member of the Supervisory Board. At the Extraordinary General Meeting (EGM) held on 25 January 2022, Nils Björkman was appointed as Supervisory Board member for a term of four years.

Due to personal circumstances, Cynthia Arnold has notified the company of her decision to resign as Supervisory Board member at the end of the first quarter of 2022. Avantium is planning to continue to have access to her valuable expertise and advice. The company will initiate a search process for a new Supervisory Board member.

As described under Diversity & Inclusion in the [Our People section](#), Avantium aspires to be an inclusive and diverse company with an open and inspiring culture. This also applies to the composition of the Supervisory Board. The Supervisory Board seeks to promote diversity among its members in terms of age, gender, nationality, experience within the industry, background, skills, knowledge and insights. As far as possible, we aim to create a balance among the Supervisory Board’s members where this diversity is represented. The objective is to comply with the Supervisory Board Profile that can be found on Avantium’s website. In 2021, the percentage of

women on the Supervisory Board was 80%. With the appointment of Nils Björkman at the EGM on 25 January 2022, Avantium now complies once again with the target of at least 30% male or female Supervisory Board members prescribed by Dutch legislation on gender balance.

Diversity Profile

Name	Year of birth	Nationality	Expertise and experience	Gender
E. Moses	1954	British	<ul style="list-style-type: none"> Scaling up innovative companies Executive and non-executive experience International experience 	Male
C.A. Arnold	1957	American	<ul style="list-style-type: none"> Chemicals and plastics industry International industry experience 	Female
M.B.B. Jou	1969	Taiwanese	<ul style="list-style-type: none"> International executive experience, especially Asian region Commercial experience from chemicals and plastics industries 	Female
M.G. Kleinsman	1963	Dutch	<ul style="list-style-type: none"> Financial expertise in chemicals and plastics industries International experience 	Female
G.E. Schoolenberg	1958	Dutch	<ul style="list-style-type: none"> Operational and engineering expertise in chemical industry International industry experience 	Female



Retirement and Re-Election Schedule

Name	Appointment date	Year of possible re-election	End of final term
E. Moses	20 December 2019	2023	2031
C.A. Arnold	30 September 2020	n.a.	n.a.
M.B.B. Jou	14 May 2020	2024	2032
M.G. Kleinsman	14 June 2017	2021	2029
G.E. Schoonenberg	30 September 2020	2024	2032

All members of the Supervisory Board are deemed independent. In the Supervisory Board's opinion, the composition of the Supervisory Board is such that the members can act critically and independently from one another and from the Management Board, as stipulated in the Dutch Corporate Governance Code (principles 2.1.7 to 2.1.9). This means that the tasks of the Supervisory Board as laid down in Avantium's Articles of Association can be fulfilled, including providing the Management Board with solicited and unsolicited advice and support.

In 2021, there was no actual or potential conflict of interest between Avantium and any Supervisory Board member. In line with legislation and as part of the key control framework of the company, members of the Supervisory Board (as well as the Management Board) are required to annually state their related parties and transactions, if any, between these related parties and the company. It was confirmed that no related-party transactions occurred in 2021, except for those cases in which members of the Supervisory Board use a management company to invoice their related directors' fees to Avantium.

Education and Self-Evaluation

Ongoing education is an important part of good governance. When not prevented by the COVID-19 pandemic, in which case audio and video conferencing solutions are used instead, members of the Supervisory Board regularly visit Avantium's offices to meet with senior management and to develop deeper knowledge of operations, opportunities and challenges. Direct, one-on-one contact between Supervisory Board members and Management Team members generally follows naturally from discussions in the meetings of the Supervisory Board. These discussions draw on the expertise of individual Supervisory Board members, whose advice is sought on a wide range of specialist topics as required. Due to the COVID-19 pandemic, most contact and dialogue in 2021 occurred electronically by means of audio and video conferencing.

Based upon the Dutch Corporate Governance Code and Section 2.2 of the Supervisory Board Regulations of Avantium N.V., the Supervisory Board is responsible for evaluating its own functioning, that of its various committees and that of the individual Supervisory Board members, and for evaluating the functioning of the Management Board as a whole and that of the individual Management Board members (in both cases outside the presence of the Management Board). In 2021, the Supervisory Board performed a self-assessment and discussion of its own performance and that of its committees and members. Face-to-face meetings, both formal and informal, were sorely missed in 2021, especially since the Supervisory Board in its current composition has been working together for less than a year. The self-assessment as completed in 2021 was positioned as a benchmark for a more thorough evaluation once the Board has been functioning in a more ordinary course of business and over a longer period of time.

The following aspects were assessed:

1. Responsibilities and composition of the Supervisory Board
2. Meetings of the Supervisory Board (information, effectiveness of the meetings and decision-making)
3. Performance of the Supervisory Board (including Board dynamics)
4. Performance of the Supervisory Board Committees
5. Performance of the Chairman
6. Relationship between Supervisory Board and Management Board

The outcome of this evaluation was discussed by the members of the Supervisory Board and the Corporate Secretary, and subsequently with the members of the Management Board. The overall conclusion of the self-assessment was that Avantium has a well-functioning Supervisory Board. The Supervisory Board also has an open and constructive relationship with the Management Board. During the year, the Supervisory Board continued to discuss its composition, its own and its committees' performance and its relationship with the Management Board and senior management. With respect to the composition of the Supervisory Board, it was decided to add a sixth (male) member, Nils Björkman, who brings additional specific knowledge and expertise while giving substance to the continuity of the Supervisory Board.



Supervisory Board Meetings in 2021

Meetings and Attendance

Supervisory Board meetings are held regularly to discuss the company's achievements and plans, the functioning and composition of the Supervisory Board and the performance of the Management Board. In its oversight capacity, Avantium's Supervisory Board has frequent communications with the Management Board, both in and between Supervisory Board meetings. The Supervisory Board met five times and had eight additional update calls in 2021. All meetings were also attended by the full Management Board, apart from the closed sessions of the Supervisory Board under the agenda item 'Supervisory Board only'. Additionally, the Supervisory Board organised one informal dinner in the autumn of 2021.

The individual attendance per meeting can be found in the table below.

Name	Supervisory Board meeting	Audit Committee meeting	Industrialisation Committee meeting	Nomination Committee meeting	Remuneration Committee meeting
E. Moses	13/13	10/10	n.a.	3/3	3/3
C.A. Arnold	13/13	n.a.	8/8	3/3	3/3
M.B.B. Jou	13/13	n.a.	8/8	3/3	3/3
M.G. Kleinsman	13/13	10/10	n.a.	n.a.	n.a.
G.E. Schoonenberg	13/13	10/10	8/8	n.a.	n.a.
N. Björkman ¹⁰	5/13	n.a.	n.a.	n.a.	n.a.

Topics Discussed in 2021

The Supervisory Board meets at least five times a year and always prior to the publication of Avantium's annual and half-year results, which are discussed with the Management Board along with related documents, such as the draft press release and the independent auditor's report on procedures performed. These results and related documents are discussed by the Audit Committee prior to the Supervisory Board meeting. The external auditor was present for the discussion of the 2021 Annual Report and accounts.

In addition to the standard agenda items for meetings, such as the development of financials and the business performance throughout the year, the Supervisory Board discussed (with the Management Board) the following topics in 2021:

- topics related to safety;
- detailed progress reports on individual business units' results and progress on strategic milestones;
- financial planning and financing;
- new technology developments;
- reports on any matters related to material risks and control and compliance issues;
- Avantium's value creation and capital allocation strategy;
- the preparation, evaluation and follow-up of the General Meeting;
- topics related to sustainability;
- the views of analysts and investors, as well as changes in the shareholder structure and base;
- initiatives related to public relations and thought leadership;
- senior leadership performance, organisational changes and senior management appointments;
- the budget for 2022.

The following topics in particular were discussed extensively by the Supervisory Board.

Progress Towards the Final Investment Decision Concerning the Construction of the FDCA Flagship Plant

The planned construction of the FDCA Flagship Plant and the progress towards a Final Investment Decision (FID) thereon was discussed at length in the Supervisory Board meetings in 2021. The Management Team and the Supervisory Board (with and without the Management Team being present) met on a very frequent basis to discuss the preparations, developments and progress in

¹⁰ Mr Björkman was appointed as member of the Supervisory Board as per 25 January 2022; meetings that he attended as an observer in 2021 are taken into account.



relation to the scale-up towards the FDCA Flagship Plant, as well as the considerations underlying key decisions in connection with the implementation of Avantium Renewable Polymers' overall business plan. The Supervisory Board gave careful consideration to all aspects, including strategic, commercial, financial, operational and legal. The Board closely monitored, discussed and mandated the negotiations with financial institutions, the key terms of the conditional offtake agreements with commercial parties and the engineering of the FDCA Flagship Plant. The discussion in the Supervisory Board meetings was often prepared by one of the committees, in particular the Industrialisation Committee and the Audit Committee.

Debt Financing

In relation to the FID, the Supervisory Board and the Management Team held regular, in-depth discussions on Avantium's funding options and scenarios. Avantium and the Renewable Polymers business unit have had direct and indirect discussions with more than 10 lenders and 150 investors. Those meetings have given management and the Supervisory Board great insight into the current terms and conditions associated with such a debt financing package. The Management Board and the Supervisory Board are of the opinion that the terms of the €90 million debt financing as offered by the consortium of lenders represents an appropriate balance of risk and reward in the current environment. The Supervisory Board therefore supported and approved the terms and conditions of the debt financing package.

Funding Options

The Supervisory Board and management also discussed funding options and funding scenarios based on short- and medium-term operational cashflow forecasts and required minimum cash balances. Moving into 2022, the Supervisory Board discussed with management material uncertainty on the going concern of the company.

Avantium Renewable Chemistries Technologies

The Supervisory Board also engaged in important discussions with the Management Board about the overall technology portfolio within Avantium Renewable Chemistries and the strategic choices for each technology. The Supervisory Board closely monitored and approved developments regarding Ray Technology, including the envisaged joint venture with sugar beet processor Cosun Beet Company. The Supervisory Board also monitored developments regarding Volta Technology and Dawn Technology.

Safety

The Supervisory Board spent significant time discussing the accident in the Ray Technology demonstration plant, including the root cause analysis, the unknown cause analysis and the implementation of safety measures.

COVID-19 Pandemic and Its Impact on Avantium

Throughout 2021, the Supervisory Board continued to discuss the ongoing uncertainties and volatility due to the COVID-19 pandemic. It continuously monitored the risks and developments in terms of strategy and scenario planning in relation to the COVID-19 crisis. This included the financial performance of the company and its ability to attract funding and partnerships for commercialising the technologies in the Renewable Polymers and Renewable Chemistries business units, as well as the ability of Avantium Catalysis to close certain sales transactions.

Stakeholder Management

The Supervisory Board takes an active interest in understanding Avantium's stakeholders, their perceptions and their positions on various topics related to the company's areas of business. The Supervisory Board was informed of stakeholders' positions by the Management Board, and also collected such information through its own network.

Supervisory Board Committee Activities in 2021

The Supervisory Board divides its tasks among four committees: the Audit Committee, the Industrialisation Committee, the Remuneration Committee and the Nomination Committee. These Committees are responsible for preparing specific topics on which the respective committee makes recommendations for decisions to be made in the plenary meetings of the Supervisory Board.

At the end of 2021, the composition of the Supervisory Board committees was as follows:

Audit Committee	Industrialisation Committee	Remuneration Committee	Nomination Committee
Margret Kleinsman (Chair)	Cynthia Arnold (Chair)	Edwin Moses (Chair)	Edwin Moses (Chair)
Edwin Moses	Michelle Jou	Michelle Jou	Michelle Jou
Trudy Schoolenberg	Trudy Schoolenberg	Cynthia Arnold	Cynthia Arnold



Report of the Audit Committee

The Audit Committee supports the Supervisory Board in its responsibility to oversee Avantium's financing, financial reporting process and financial statements, and its internal control, risk management and audit systems. In 2021, the Audit Committee met four times and held two calls to approve the annual and half-year results. The meetings were also attended by the CEO, the CFO, the Compliance Officer, the Head of Accounting and Reporting and the external independent auditor. Additionally, four calls were held to discuss the progress of the debt funding of the FDCA Flagship Plant. Minutes of all meetings were submitted to the Supervisory Board. At each meeting, the Audit Committee discussed relevant financial reporting and accounting topics, including the Going Concern Note in the 2021 Annual Report, specific accounting papers linked to the FID and the new Sustainability Reporting Directive. The Audit Committee also discussed Risk Management targets and the findings of internal and external risk assessments, including the findings of the risk assessment performed on Avantium's grant programmes. The Audit Committee paid specific attention to the project to improve ICT security. Moreover, the Audit Committee monitored the company's progress on risk identification and implementation of risk mitigation actions and approved the 2022 Risk Planning.

Report of the Industrialisation Committee

The Industrialisation Committee serves as the Supervisory Board's advisory and risk review forum in providing oversight of (i) the company's technology strategy; (ii) industrialisation roadmaps; and (iii) technology portfolio, all as determined, formulated, and executed by the company's Management Board and senior management. The Industrialisation Committee met eight times in 2021 and discussed in detail the commercialisation strategy for YXY Technology and the progress towards a FID on the construction of the FDCA Flagship Plant. The Industrialisation Committee thoroughly reviewed a significant number of in-scope topics, such as the business case and financial model, application development, market outlook, competitive landscape, the YXY Technology IP position, risk register-related topics, the technology and the licensing technology roadmap.

Report of the Remuneration Committee

The Remuneration Committee is responsible for advising the Supervisory Board on remuneration. One of its standard duties is to assess whether the Management Board's performance targets have been achieved. The Remuneration Committee met three times in 2021 to discuss and formulate proposals for the remuneration of the individual members of the Management Board. The Remuneration Committee presented its findings and proposals to the Supervisory Board, which then finalised the performance appraisals and related remuneration of the individual Management Board members.

Report of the Nomination Committee

The Nomination Committee's standard duties include assessing the composition of the Supervisory Board and the Management Board, evaluating the functioning of individual members, succession planning and monitoring corporate governance. The meetings of the Nomination Committee are attended by the CEO, except when issues relating to his performance and remuneration are discussed. The Nomination Committee met three times in 2021.

Report of the Annual General Meeting of Shareholders

At the General Meeting held on 19 May 2021, the CEO and CFO reported on the overall state of affairs at Avantium as well as its financial performance and remuneration in 2020. The General Meeting adopted the 2020 financial statements and gave positive advice on the Remuneration Report 2020. The members of the Management Board were granted discharge of liability for their management in 2020, and the members of the Supervisory Board for their supervision thereof. Tom van Aken was re-appointed as CEO and a statutory member of the Management Board, while Margret Kleinsman was re-appointed to the Supervisory Board. The General Meeting also approved the proposal to authorise the Management Board to issue up to 5% ordinary shares in connection with the company's long-term incentive and share-based compensation plans. PricewaterhouseCoopers Accountants N.V. (PwC) in the Netherlands was appointed external auditor for the financial year 2021. As in previous years, the Chair of the Audit Committee elaborated on the work of the Audit Committee in 2020, on the company's collaboration with PwC and on other items relevant in the past year. The lead partner of PwC was given the floor to elaborate on the audit procedure and the auditor's report on 2020.

Following the Dutch government's Temporary Act COVID-19 Justice and Safety (the 'Emergency Act'), Avantium decided to make the General Meeting on 19 May 2021 accessible to shareholders only via electronic means, namely a live webcast hosted on Avantium's website. Shareholders could therefore attend the General Meeting online but were not granted physical access; however, Avantium provided shareholders with the opportunity to participate interactively and to exercise their shareholders' rights in line with the Emergency Act.



Financial Statements 2021 and Profit Appropriation

The financial statements for the financial year 2021 were prepared by the Management Board in compliance with Articles 20 and 21 of the Articles of Association. Attached to these statements was the unqualified report from the independent auditor PwC, with an emphasis of matter regarding a material uncertainty related to going concern. The financial statements and the outcome of the external audit were discussed by the Audit Committee with the Management Board in the presence of the external independent auditor.

The 2021 financial statements were endorsed by all Management Board and Supervisory Board members and are, together with PwC's independent auditor's report, included in this Annual Report. The Management Board will present the 2021 financial statements at the General Meeting on 18 May 2022.

Gratitude

The Supervisory Board wishes to thank all Avantium employees for their dedication, creativity and perseverance, enabling Avantium to move to an exciting new chapter in commercialising the plant-based, fully recyclable plastic material PEF. The Supervisory Board is very grateful to the Management Board and senior management of Avantium for their leadership and for their constructive and transparent dialogue with the Supervisory Board.

Amsterdam, 22 March 2022

On behalf of the Supervisory Board,

Edwin Moses, Chair
Cynthia Arnold
Michelle Jou
Margret Kleinsman
Trudy Schoolenberg



Remuneration Report 2021

Letter from the Chair of the Remuneration Committee

On behalf of the Remuneration Committee, I am pleased to report on the Committee's activities in 2021. Below, I will reflect briefly on the year, our remuneration policy and the key motivations behind our decisions with regard to rewards and targets.

Looking back, 2021 was a defining year for Avantium on its way to commercialising its breakthrough technology. The company made significant progress in the execution of its business plan, and an important number of strategic targets were met.

In December 2021, Avantium announced that it had taken a positive Final Investment Decision (FID) with regard to the construction of its FDCA Flagship Plant. This positive FID concluded two intense years during which the company worked diligently to satisfy the three key conditions it had defined as being necessary to meet prior to starting the construction of its FDCA Flagship Plant: (i) securing sufficient financing; (ii) finalising the engineering and establishing the supply chain; and (iii) obtaining sufficient offtake commitments for the FDCA Flagship Plant. In early December 2021, Avantium secured the financing for the construction of the FDCA Flagship Plant with €90 million in debt financing from a consortium of Dutch banks and the Dutch government-backed impact investment fund, Invest-NL. As a consequence, all three key conditions had been fulfilled, allowing the company to take a positive FID to proceed with the construction of the FDCA Flagship Plant.

Avantium also achieved important milestones in relation to its other technologies. For example, for its Ray Technology, Avantium completed the application validation for both plantMEG™ and plantMPG™. In April 2021, Avantium and sugar beet processor Cosun Beet Company agreed a term sheet to establish a joint venture to construct a first commercial plant to produce plantMEG™ and plantMPG™ using Ray Technology. In addition, Avantium commenced pre-pilot testing of its Volta Technology at various partners' sites in Europe.

The company has also encountered some setbacks. In particular, due to an accident, operations were temporarily halted in the Ray Technology demonstration plant in Delfzijl.

In 2021, revenues in all of the Avantium business segments started to recover, as problems related to the pandemic began to resolve. Avantium Catalysis continued to be affected by COVID-19 travel

restrictions, which prevented installations, maintenance and upgrades of Flowrence® systems at customers' sites. However, the division was able to maintain business continuity in contract research – running catalysis experiments on behalf of customers throughout the year. Avantium's consolidated revenues increased by 11% from €9.9 million in 2020 to €10.9 million in 2021.

During 2021, Avantium continued to manage its cash prudently. The company's cash position (including restricted cash) was €34.9 million as at 31 December 2021, as a result of a successful capital raise that took place in April 2021, raising €27.8 million through an accelerated bookbuild. Net cash outflow (cash flow excluding the capital raise) for the year was €18.1 million, versus €18.8 million in 2020.

Our remuneration policy for the Management Board aims to support the long-term development of the company in a highly dynamic environment. To optimally balance all relevant interests, it takes account of Avantium's long-term strategic objectives, seeks to be consistent with the company's overall remuneration policy and respects the interests and opinions of the various stakeholder groups.

In 2021, the Remuneration Committee met three times. In addition to detailed discussions on the corporate targets, and then assessment of their level of subsequent achievement, special attention was paid to the topic of further refining the strategic key performance indicators (KPIs) and considering the extent to which they could be more transparently communicated externally without releasing commercially sensitive information.

The Remuneration Committee had intended to propose, if necessary, a revision of the remuneration policy in 2022. After careful consideration, the Remuneration Committee concluded that no revisions were currently necessary. The Committee had listened carefully to shareholders' feedback on the Remuneration Report 2020 and the remuneration policy for the members of the Management Board and the Supervisory Board. This resulted in an adjusted approach in reporting, including the level of reporting transparency on target setting and achievement, which is reflected in the Remuneration Report 2021. The Committee also concluded that taking into account all relevant factors, no adjustments would be proposed to the Management Board's and senior management's remuneration at this time.



The Remuneration Committee has carefully weighed all aspects of this challenging but in many ways successful year, and has taken care to ensure that the impact of the year's events were reflected in a fair application of the remuneration policy and the assessment of this year's target achievement. The fact that Avantium made significant progress on the delivery of its business plan, and was able to meet important strategic milestones and targets, is reflected in the remuneration to be paid to the Management Board.

After careful consideration and following the proposal made by the Remuneration Committee on the target achievements for each of the goals identified for 2021, the Supervisory Board made the following decisions:

- The annual performance-related cash and non-cash variable remuneration (Bonus) for 2021 realised a target achievement of 83.75% of the on-target Bonus pay-out percentage (the on-target Bonus, i.e. the Bonus in case of on-target performance, is equal to 100% of (i) 70% of base salary for the CEO, and (ii) 50% of base salary for the CFO).
- The assessment of the achievement of the company's 2021 goals will form the basis for the cash incentive bonus payment to all staff, and will be used, together with the assessment of the achievement of an individual's personal goals, to determine the Management Board's and senior management's annual performance-related cash bonus component (Short-Term Incentive) and the non-cash long-term annual variable incentive component (Long-Term Incentive).
- The actual timing of the (cash) pay-out of the Bonus will be decided in Q2 2022.

Based on feedback by shareholders on the remuneration policy and the Remuneration Report 2020, as discussed during and after the General Meeting of 2021, the Remuneration Committee reviewed Avantium's decision to be restrictive with regard to the disclosure of the Management Board's exact targets, both in advance and retrospectively in view of the Remuneration Committee's assessment of the targets' realisation. Although the Committee maintains its view that these goals qualify as strategically and commercially sensitive information, it realises that more transparency towards its external stakeholders is strongly desired. The company has therefore sought to continue to evolve its level of disclosure related to corporate targets, in order, among other reasons, to confirm that the targets set are fully in line with the long-term strategy of Avantium to maximise the value of its technologies. The 2022 targets represent a list of long- and short-term goals that are aligned with the company's execution of its strategy. As an important element thereof, these goals should drive the company's performance on environmental, social and governance (ESG) criteria. As a technology leader in sustainable and circular chemicals and plastics, Avantium aims to meet ESG standards and plans to report in a transparent way on its progress in implementing its Sustainability Plan (Chain Reaction 2030).

The Remuneration Committee continues to believe that the one-off fixed award of share options to members of the Supervisory Board upon their appointment is important in attracting the required level of talent to the company. The remuneration package for its Supervisory Board members should enable Avantium to attract and retain diverse members with a broad international background and the right balance of personal skills, competences and experience required to oversee the company's performance and the ongoing development and execution of its long-term strategy. The Committee believes that the one-off fixed award of share options contributes to Avantium's long-term value creation and serves as a long-term investment in Avantium, aiming to align the Supervisory Board members' respective interests with those of the other shareholders.

The Remuneration Committee will continue to regularly assess Avantium's remuneration policy and advise the Supervisory Board on the need for further changes. The Remuneration Committee intends to submit an updated version of Avantium's remuneration policy for the Management Board and the Supervisory Board for approval during the 2023 General Meeting, including any updates to address further developments in remuneration practices and taking into consideration any adjustments resulting from remuneration benchmark assessments and feedback received from shareholders. We remain committed to remuneration practices and policies that allow us to attract, retain and motivate high-performing employees while paying close attention to appropriate alignment with all stakeholders.

I look forward to discussing the policy and actual remuneration practices in the 2022 Annual General Meeting of Shareholders, and will be happy to answer any questions you may have.

Edwin Moses

Chair of the Remuneration Committee



Introduction

This Remuneration Report provides a summary of the remuneration policy of Avantium's Management Board and Supervisory Board, as well as an overview of the remuneration of the members of the Management Board and the Supervisory Board paid in the financial year 2021. This Remuneration Report is prepared in accordance with the relevant parts of Section 135, Book 2 of the Dutch Civil Code, in line with the EU guidelines based on the EU Shareholders' Rights Directive. The remuneration is furthermore determined in accordance with the remuneration policy adopted at the General Meeting on 14 May 2020, with an effective date of 1 January 2020. After approval by the Supervisory Board, the Remuneration Report will be submitted to the General Meeting on 18 May 2022 for an advisory vote of our shareholders, in line with Section 135b subsection 2, Book 2 of the Dutch Civil Code.

Remuneration Policy

Introduction and Governance of the Remuneration Policy

The last update of the remuneration policy was adopted by the General Meeting on 14 May 2020 and became effective as per 1 January 2020. In view of the new Dutch legislation resulting from Directive (EU) 2017/828 (Shareholder Rights Directive II), the Supervisory Board conducted a comprehensive review and comparison of its remuneration policy for the members of the Management Board and the Supervisory Board, which has led to the latest remuneration policy.

The remuneration policy supports the long-term development and strategy of the company, while aiming to fulfil all stakeholders' requirements and keeping an acceptable risk profile. The Supervisory Board ensures that the policy and its implementation are linked to Avantium's strategic goals and objectives. The policy is designed to encourage behaviour that is focused on long-term value creation for all stakeholders, while the highest standards of good corporate governance are adopted. The remuneration policy is aimed at motivating the accomplishment of outstanding achievements, using a combination of non-financial and financial performance measures.

The Remuneration Committee intended to propose, if necessary, a revision of this remuneration policy in 2022. After careful consideration, the Remuneration Committee concluded not to endorse any revisions this year. Revisions would primarily comprise adjustments resulting from the Committee's due consideration to the feedback received from shareholders on the Remuneration Report 2020 and the remuneration policy for the members of the Management Board and the Supervisory Board. The Remuneration Committee concluded that the adjusted approach in

reporting, including its level of reporting transparency on target setting and achievement, may for this year be addressed in the Remuneration Report 2021. It furthermore concluded that given that the Management Board's and senior management's remuneration continues to fall within a competitive range of approximately 20% around the median market levels payable within the reference groups of industrial companies in our sector, no adjustments are proposed at this time.

Based on feedback from shareholders on the remuneration policy and the Remuneration Report 2020, as discussed during and after the General Meeting of 2021, the Remuneration Committee reviewed Avantium's decision to be restrictive on the disclosure of the Management Board's exact actual targets, both in advance and retrospectively in view of the Remuneration Committee's assessment of the targets' realisation. Although the Committee maintains its view that these qualify as strategically and commercially sensitive information, it realises that more transparency towards its external stakeholders is strongly desired, among other reasons in order to confirm that the targets set are fully in line with the long-term strategy of Avantium to maximise the value of its technologies.

The 2022 targets represent a list of long- and short-term goals that are aligned with the company's execution of its strategy. As an important element thereof, these goals should drive the company's performance on environmental, social and governance (ESG) criteria. As a technology leader in sustainable and circular chemicals and plastics, Avantium aims to meet ESG standards and plans to report in a transparent way its progress on implementing its Sustainability Plan (Chain Reaction 2030).

The Remuneration Committee maintains its view on the one-off fixed award of share options to members of the Supervisory Board upon their appointment. The remuneration package for its Supervisory Board members should enable Avantium to attract and retain diverse members with a broad international background and the right balance of personal skills, competences and experience required to oversee Avantium's (execution of its) long-term strategy and performance. The one-off fixed award of share options contributes to Avantium's long-term value creation and serves as a long-term investment in Avantium, aiming to align the members' respective interests with those of the other shareholders.

The Supervisory Board is responsible for the execution of the remuneration policy. The Remuneration Committee will continue to regularly assess the remuneration policy and advise the Supervisory Board on the further alignment of the interests of management with those of shareholders and other stakeholders.

The Remuneration Committee intends to submit an updated version of Avantium's remuneration policy for the Management Board and the Supervisory Board for approval during the 2023 Annual



General Meeting of Shareholders, including any updates to address further developments in remuneration practices or to take into consideration any adjustments resulting from remuneration benchmark assessments and feedback received from shareholders during and prior to the General Meeting.

External Perspective: Reference Group and Market Positioning

As with the remuneration philosophy for all Avantium employees, the remuneration of the Management Board should be competitive compared with a relevant reference market. To define this market, a reference group is created by the Supervisory Board, consisting of companies that are selected on criteria such as geography, governance framework, scope and type of industry. In principle, a benchmark is conducted at least once every four years. In the years without a benchmark, the Supervisory Board considers the appropriateness of any change of base salary based on the market environment as well as the salary adjustments for other Avantium employees.

As a guiding principle, the total direct remuneration of the Management Board is set at or around the median of the reference market.

In 2021, in line with the remuneration policy, the Supervisory Board conducted a remuneration benchmark assessment of the market competitiveness of the current compensation package of the members of the Management Board. The Supervisory Board carefully reviewed the reference group for the benchmark assessment and amended it according to the above-mentioned criteria. Geographically, the amended reference group consists primarily of listed western European companies and, exceptionally, some non-European companies that are highly relevant from a talent market perspective or industry perspective. Furthermore, the weighting of UK, US and Swiss companies does not exceed 50% of the reference group. From a scope and type-of-industry point of view, the reference group includes companies of comparable size that are primarily active in the (specialty) chemicals and materials and biotechnology industries.

The companies in the reference group for the Management Board remuneration benchmark assessment performed in 2021 are:

- Accsys Technologies PLC (UK)
- Amyris Inc (US)
- BRAIN Biotechnology Research and Information Network AG (DE)
- Carbios SA (FR)
- Evolva Holding SA (CH)
- Global Bioenergies SA (FR)
- Holland Colours NV (NL)
- IBU-tec advanced materials AG (DE)

- Iofina PLC (UK)
- Isagro SpA (IT)
- Metabolic Explorer SA (FR)
- Nabaltec AG (DE)
- SICIT Group SpA (IT)
- Treatt PLC (UK)
- Versarien PLC (UK)
- Zotefoams PLC (UK)

The remuneration benchmark assessment was performed on the following compensation elements:

- Base salary
- Target short-term incentive (STI)
- Total cash compensation (TCC) – base salary plus STI
- Annualised expected value of the long-term incentive (LTI)
- Total direct compensation (TDC) – TCC plus LTI

The outcome of the 2021 benchmark resulted in the conclusion that for all of the compensation elements, the Management Board remuneration falls within a competitive range of +/-20% around the median market levels payable within the reference group, which is in line with our remuneration policy.

Management Board Remuneration 2021

The remuneration paid to the members of the Management Board in 2021 was based on Avantium's remuneration policy and its governance process.

The remuneration of the members of the Management Board consists of the following components:

- i) fixed annual base salary;
- ii) short-term annual variable remuneration (in cash);
- iii) long-term annual variable remuneration in the form of shares (LITP) and options (employee stock option plan, or ESOP); and
- iv) allowance for pension and fringe benefits.

Avantium does not grant any personal loans, guarantees or advance payments to members of the Management Board.



i) Fixed Annual Base Salary

The objective of the fixed annual base salary is to compensate for the performance of day-to-day activities. The fixed annual base salary of the members of the Management Board is based on the level of responsibility and performance and is set at or around the median of the remuneration levels payable within the reference group.

In line with the remuneration policy, in 2021 the full year base salary of the CEO, Tom van Aken, remained at €267,800. The full year base salary for the CFO, Bart Welten, remained at €235,000.

In view of the COVID-19 pandemic and owing to the partial achievement of the company's strategic goals in 2020, at the request of the Management Board, any considered salary increases were not implemented in 2021.

ii) Short-Term Annual Variable Remuneration

The objective of the short-term annual variable remuneration is to ensure that the members of the Management Board focus on realising their short-term operational objectives, leading to longer-term value creation.

The bonus refers to the annual performance-related cash and non-cash incentive that is applicable to the members of the Management Board and comprises (i) a cash component consisting of no more than 50% of the aggregate bonus, if any, and (ii) a non-cash component equivalent to the cash component which must be invested in Investment Shares (see under iii.a Long-Term Investment Plan in the Form of Matching Shares).

The Supervisory Board has the discretionary power to adjust the incentive pay-out up- or downwards if it feels that the outcome is unreasonable due to exceptional circumstances during the performance period, such as by taking into account the long-term interests and sustainability of the company as a whole. Scenario analyses of the possible outcomes of the variable remuneration components and their effect on the remuneration of the Management Board are conducted. This power was not used in 2020, nor was any remuneration recovered from present or former Management Board members.

Performance Measures

The performance measures form a balanced mix of strategic, commercial and operational performance targets, which together ensure a focus on both the (financial) performance of the company in the short term and the sustained company future in reaching its long-term strategic objectives. For each of the performance measures, the Supervisory Board sets challenging, but realistic, targets and target levels.

The performance targets are specific and measurable and are formulated and communicated at the beginning of each financial year (except for circumstances where the Supervisory Board considers semi-annual target-setting more appropriate), although the Supervisory Board may adjust the targets and their relative weighting if required by significantly changed strategic priorities in any given year. Following a presentation by the Management Board, the Supervisory Board sets the targets, based on strategic progress, commercial performance and operational performance, in relation to Avantium's strategy and long-term objectives, as set out in the remuneration policy (www.avantium.com/corporate-governance/#remuneration). When the performance criteria are set, the interests of all stakeholders are taken into account.

In order to achieve alignment in the remuneration structure of the Management Board and other Avantium employees, a subset of the bonus performance measures, target-setting and pay-out schemes as set out in the remuneration policy is applicable to Avantium employees.

The strategic progress targets are based on value creation for shareholders and realising strategic focus. The targets for commercial performance are based on securing strategic partnerships for the commercialisation of technology programmes and reaching the commercialisation phase of the different technology programmes (path from laboratory scale to demonstration scale and finally commercialisation scale). One such target was to take a positive FID on the construction of the FDCA Flagship Plant and formalise approval for the project by the end of 2021. The operational performance targets are financial targets, consisting of budget cash runway components.

Although Avantium maintains its view that detailed targets qualify as strategically and commercially sensitive information, it realises that more transparency towards its external stakeholders is strongly desired, both in advance on target setting and retrospectively in view of the Remuneration Committee's assessment of the targets' realisation. Among other reasons, this will confirm that the targets set are fully in line with the long-term strategy of Avantium to maximise the value of its technologies.



For the annual bonus 2021, the on-target bonus, i.e. the bonus in case of on-target performance, is equal to 100% of (i) 70% of base salary for the CEO and (ii) 50% of base salary for the CFO. The maximum bonus, i.e. the bonus in case of above-target performance, is equal to 150% of the on-target bonus. If performance is below a predefined threshold level, no bonus will be paid out. The members of the Management Board are, together with senior management, obligated to invest the total non-cash component of their (net) bonus in investment shares. The non-cash component percentage of the bonus is 50%. The cash component of the bonus may, at the discretion of the relevant member of the Management Board, also be invested in investment shares.

The bonus pay-out levels are prorated upon the level of achievement of the aforementioned performance targets.

For the annual bonus 2021, the performance targets and their relative weighting were set in the middle of February 2021 as follows:

Name	Weight factor	Target
T.B. van Aken	73%	Strategic Differentiators
	8%	Commercial Performance
	20%	Operational Performance
B.J.J.V. Welten	73%	Strategic Differentiators
	8%	Commercial Performance
	20%	Operational Performance

As set out in the section 'Letter from the Chair of the Remuneration Committee', 2021 was a defining year for Avantium on its way to commercialising its breakthrough technologies. Avantium made significant progress in the execution of its business plan, and an important number of strategic targets were met in 2021.

The Remuneration Committee has carefully weighed all aspects of this challenging but in many ways successful year, and has taken particular care to ensure that the impact of the year's events were reflected in a fair application of the remuneration policy and this year's target achievement. The fact that Avantium made significant progress on the delivery of its business plan, and was able to meet some of its important strategic milestones and targets, is reflected in the remuneration to be paid to the Management Board.

After careful consideration and following the proposal made by the Remuneration Committee on the target achievements for each of the goals identified for 2021, the Supervisory Board made the following decisions:

- The annual performance-related cash and non-cash variable remuneration (Bonus) realised a target achievement of 83.75% of the maximum of 100% of the on-target Bonus pay-out percentage.
- The evaluation of the company's 2021 targets will form the basis for the cash incentive bonus payment to all staff, and will be used to determine the pay-out to the Management Board and senior management's annual performance related cash bonus component (Short-Term Incentive) and the non-cash long term annual variable incentive component (Long-Term Incentive).
- The actual timing of the (cash) pay-out of the Bonus will be decided in Q2 2022.

In line with Avantium's performance in 2021, as set out in the section '[The Value We Created in 2021](#)', it was concluded that Strategic Differentiator targets were partly achieved, Commercial targets were partly achieved and Operational Performance targets were partly achieved. This resulted in the conclusion of the Supervisory Board that 83.75% of the targets have been achieved. The Supervisory Board has not used any upwards or downwards discretion.

The overall average achievement of the Management Board members for performance year 2021 amounts therefore to 83.75% of the maximum achievable bonus. The maximum achievable bonus for Tom van Aken is 70% (therefore resulting in a variable remuneration for 2021 of 59% of his annual base salary). The maximum achievable bonus for Bart Welten is 50% (therefore resulting in a variable remuneration for 2021 of 42% of his annual base salary).

Name	Weight factor	Target	Measured performance	Total performance in 2021
T.B. van Aken	73%	Strategic Differentiators	91%	84%
	8%	Commercial Performance	67%	
	20%	Operational Performance	63%	
B.J.J.V. Welten	73%	Strategic Differentiators	91%	84%
	8%	Commercial Performance	67%	
	20%	Operational Performance	63%	

iii) Long-Term Variable Remuneration in the Form of Shares (LTIP) and Options (ESOP)

On 5 October 2016, Avantium adopted the ESOP for all key employees, senior management and members of the Management Board and the LTIP for the members of the Management Board and the management team (collectively, the Incentive Plans). The Incentive Plans encourage a long-term focus and alignment with Avantium's strategy.



iii.a) Long-Term Investment Plan in the Form of Matching Shares

The members of the Management Board are obligated to invest the total non-cash component of their (net) bonus in shares to be delivered by the company (Investment Shares). The non-cash component percentage is 50%. The cash component of the bonus may, at the discretion of the relevant member of the Management Board, also be invested in Investment Shares. The Investment Shares are subject to a retention period of five years following the investment date. After the end of the retention period, Avantium will match the Investment Shares in a 1:1 ratio (Matching Shares); that is, one Matching Share is granted for each Investment Share. Based on the feedback from shareholders on the remuneration policy and the Remuneration Report 2020, as discussed prior to and after the General Meeting of 2021, the delivery of the Matching Shares requires a clarification. These Matching Shares are delivered by the company at the end of the five-year retention (lock-up) period of the Investment Shares.

The objective of the plan is that Management Board members build an equity position in the company.

iii.b) Long-Term Variable Remuneration in the Form of Share Options (under the ESOP)

On an annual basis, share options under the ESOP (Options) may be conditionally awarded to members of the Management Board in accordance with the performance parameters pre-determined by the Supervisory Board. These parameters are consistent with the performance measures applied for the senior management and key employees of Avantium, to ensure optimal alignment with the employees of Avantium who receive Options. Options are awarded within a pre-determined range, as stated in the remuneration policy (Section 4.6), where the actual annual award is set by the Supervisory Board.

The Options are fully vesting on the third anniversary following the date of the award. The exercise period of the Options will be up to five years after the date of vesting. Based on the feedback from shareholders on the remuneration policy and the Remuneration Report 2020, as discussed prior to and after the General Meeting of 2021, the vesting period of the Options requires a clarification. The Options vest at the end of a three-year vesting term and not on an annual pro rata basis during this three-year vesting period. Only in the event that the member of the Management Board is no longer employed by the company at the date of vesting will the number of options be decreased as provided for in the ESOP (depending on the employment termination date and cause of leave, on an annual pro rata basis during a period of three years).

iii.3) Adjustments to Variable Remuneration

In line with Dutch law, the variable remuneration of the members of the Management Board may be reduced, or Management Board members may be obliged to repay (part of) their remuneration to the company, if one of the circumstances as described in Section 5 (Management Board Remuneration: Adjustments to Variable Remuneration) of the remuneration policy apply. In 2021, no adjustments based upon this section of the remuneration policy were made.

iv) Allowance for Pension and Fringe Benefits

The members of the Management Board are allowed to participate in Avantium's pension plan, available to all Avantium employees, whereby Avantium carries the employer's contribution of the pension contributions. The pension plan is based on a defined contribution system. Legislation in 2015 reduced the maximum pension accrued to 1.875% (from 2.15%) of the full pensionable salary. The members of the Management Board can choose to build up the part of the pensionable salary above €110,111 (2020) in a separate defined contribution plan. There are no arrangements for early retirement.

The members of the Management Board are entitled to additional remuneration elements, such as company car costs, travel expenses, social security costs and a contribution to health and disability insurance, all in line with applicable Avantium policies, plans and arrangements. The table hereafter provides a breakdown of the remuneration of the members of the Management Board in 2021.

Employment Agreements and Severance Payments

The members of the Management Board continued their current employment agreements with Avantium Support B.V., a subsidiary of the company. These agreements are for an indefinite period of time and do not contain severance payment provisions.

The Supervisory Board may determine that a member of the Management Board is entitled to a severance payment for the loss of income resulting from a non-voluntary termination as Management Board member. In line with the Dutch Corporate Governance Code, any severance payment is limited to one year's base salary.

Total Remuneration Received by Members of the Management Board

(In €1,000)	Fixed remuneration		Variable			Total remuneration	% of fixed remuneration	% of variable remuneration
	Salary	Other benefits ¹¹	Short-term bonus ¹²	Long-term award ¹³	Post-employee benefits			
Management Board member								
T.B. van Aken								
2021	268	25	157	119	20	589	53%	47%
2020	268	26	—	127	19	440	71%	29%
B.J.J.V. Welten								
2021	235	27	98	25	27	411	70%	30%
2020	228	26	—	25	25	304	92%	8%
Total - 2021	503	52	255	144	46	1,000	60%	40%
Total - 2020	495	52	—	152	44	744	80%	20%

The total remuneration based on IFRS in 2021 for Tom van Aken amounted to €584,000 (2020: €430,000) due to the share-based payment expenses of €114,000 recognised during the year (2020: €117,000). The total remuneration based on IFRS in 2021 for Bart Welten amounted to €439,000 (2020: €307,000) due to the share-based payment expenses of €52,000 recognised during the year (2020: €29,000).

Internal Pay Ratio

In setting the remuneration policy for the members of the Management Board, the Supervisory Board also takes into account the internal pay ratio. The internal pay ratio between the average pay of Avantium employees vis-à-vis the average pay of the CEO is calculated based on the average 2021 remuneration of all Avantium employees vis-à-vis the 2021 remuneration of the CEO. Since 2020, we have also included pension contributions and long-term incentive components.

¹¹ Other benefits mainly include contributions to social security plans and benefits in kind such as company cars, medical expenses and legal expenses.

¹² Including the cash and non-cash part of the awarded bonus for the specific performance year.

¹³ Including the value of the various performance share-based plans that vested during the year. The value of the LTIP reward is calculated based on the number of matching shares that have vested and of the share price at the date of vesting. The value of the ESOP reward is calculated based on the number of share options that have vested during the year and the net of the share price at vesting date less the exercise price.



The 2021 pay ratio is 6:1 for the CEO. The pay ratio for 2020 would have been 5:1 based on the specific guidance provided by the Monitoring Commissie Corporate Governance Code in December 2020 on the calculation methodology of the pay ratio.¹⁴

The following table provides an overview of the remuneration of the members of the Management Board compared with the average total remuneration of an Avantium employee (defined as gross wages, holiday allowance, other benefits, pension, Bonus and long-term awards) and company performance since the listing of the company's shares in 2017.

(In €1,000)	2021	% change	2020	% change	2019	% change	2018	% change	2017
Management Board member									
T.B. van Aken	589	34%	440	2%	432	41%	306	-17%	368
B.J.J.V. Welten	411	35%	304	0%	—	0%	—	0%	—
F.C.H Roerink (former CFO)	—	0%	—	-100%	616	120%	280	-13%	321
Average employee salary	91	12%	81	15%	70	0%	70	7%	66

	2021	% change	2020 ¹⁵	% change	2019	% change	2018	% change	2017
Total company performance	84%	—%	—%	-100%	65%	122%	29%	-66%	86%
Strategic Differentiators	73%	—%	—%	-100%	67%	168%	25%	-63%	68%
Commercial Performance	8%	—%	—%	-100%	55%	175%	20%	-80%	100%
Operational Performance	20%	—%	—%	-100%	100%	11%	90%	-10%	100%

The table includes information on a four-year period as of 2017, the year Avantium became a publicly traded company.

It is noted that Frank Roerink's severance payment is included in his total remuneration for the year 2019.

¹⁴ Starting as of 1 January 2021, the value of the share-based component of the remuneration is determined at the time of assignment in accordance with the applicable rules under IFRS. Before 1 January 2021, the value of the share-based component of the remuneration was determined based on the value of the options that vested during the year and the net of the share price at vesting date less the exercise price.

¹⁵ The company's performance and achievement of the performance measures for 2020 was set to zero percent herein; as the Management Board and senior management decided to forfeit their respective annual cash bonus, the company elected not to disclose the realised achievement of the 2020 performance targets.

Number of Investment Shares and Matching Shares Outstanding and Awarded to the Management Board

Management Board member	Specification of plan	The main conditions of share plans				Information regarding the reported financial year						
		Performance period	Award date	Vesting date	End of retention period	Number of awards outstanding 1 January	Shares allocated during the year	Shares forfeited during the year	Shares vested during the year	Value of matching shares vested during the year in EUR ¹⁶	Matching shares unvested as at 31 December	Shares subject to retention period as at 31 December
T.B. van Aken, CEO	LTIP- Investment shares	2017-2018	16/3/2018	16/3/2018	16/3/2023	7,441	—	—	—	—	—	7,441
		2019-2020	14/5/2020	14/5/2023	14/5/2025	15,365	—	—	—	—	—	15,365
	LTIP- Matching shares	n/a	16/3/2018	16/3/2021	16/3/2023	7,441	—	—	413	2,216	—	—
		n/a	14/5/2020	14/5/2023	14/5/2025	15,365	—	—	5,122	27,452	10,243	—
F.C.H Roerink, former CFO	LTIP- Investment shares	2017-2018	16/3/2018	16/3/2018	16/3/2023	5,789	—	—	—	—	—	5,789
	LTIP- Matching shares	n/a	16/3/2018	16/3/2021	16/3/2023	1,930	—	—	—	—	—	1,930
Total Management Board members						45,612	—	—	5,535	29,668	10,243	22,806
Total former Management Board members						7,719	—	—	—	—	—	7,719

¹⁶ The value of matching shares vested during the year is expressed in EUR and is determined by the share price at vesting date.

Number of Options Outstanding and Awarded to the Management Board

Management Board member	Specification of plan	The main conditions of share option plans				Information regarding the reported financial year						
		Award date	Vesting date	Exercise period	Exercise price of the option in EUR	Number of options outstanding as at 1 January	Share options granted during the year	Share options forfeited during the year	Share options vested during the year	Value of share options vested during the year ¹⁷	Share options unvested as at 31 December	Share options vested as at 31 December
T.B. van Aken, CEO	ESOP	19/10/2006	19/10/2009	10 years	7.60	20,230	—	—	—	—	—	20,230
		1/10/2008	1/10/2011	10 years	0.10	20,657	—	—	—	—	—	20,657
		1/5/2009	1/5/2012	10 years	0.10	35,000	—	—	—	—	—	35,000
		1/5/2010	1/5/2013	10 years	0.10	29,770	—	—	—	—	—	29,770
		4/11/2010	4/11/2013	10 years	0.10	28,000	—	—	—	—	—	28,000
		30/11/2011	30/11/2014	10 years	0.10	135,000	—	—	—	—	—	135,000
		1/10/2015	15/3/2017	10 years	0.10	22,000	—	—	—	—	—	22,000
		1/10/2015	15/3/2017	10 years	9.80	7,500	—	—	—	—	—	7,500
		2/3/2017	15/3/2017	10 years	0.10	13,000	—	—	—	—	—	13,000
		2/3/2017	15/3/2017	10 years	9.80	18,000	—	—	—	—	—	18,000
		17/5/2017	17/5/2020	8 years	10.58	50,000	—	—	—	—	—	50,000
		28/3/2018	28/3/2021	8 years	5.34	50,000	—	—	2,778	—	—	50,000
		16/5/2019	16/5/2022	8 years	2.60	100,000	—	—	33,333	64,521	11,111	88,889
14/5/2020	14/5/2023	8 years	3.59	50,000	—	—	16,667	24,679	22,222	27,778		
19/5/2021	19/5/2024	8 years	4.56	—	50,000	—	11,111	—	38,889	11,111		
B.J.J.V Welten, CFO	ESOP	14/5/2020	14/5/2023	8 years	3.59	50,000	—	—	16,667	24,679	22,222	27,778
		19/5/2021	19/5/2024	8 years	4.56	—	30,000	—	6,667	—	23,333	6,667
Total Management Board members						629,157	80,000	—	87,222	113,878	117,778	591,379

In 2021, 80,000 additional share options were granted to the Management Board. The share-based payment expenses of the Management Board of €167,000 comprise the part of the share-based compensation (note 12) contributable to the share options granted in previous years.

¹⁷ The value of share options vested during the year is expressed in EUR and is determined by the share price at vesting date less the exercise price.

Number of Options Outstanding and Awarded to Former Management Board Member

Management Board member	Specification of plan	The main conditions of share option plans				Information regarding the reported financial year						
		Award date	Vesting date	Exercise period	Exercise price of the option in EUR	Number of options outstanding as at 1 January	Share options exercised during the year	Share options forfeited during the year	Share options vested during the year	Value of share options exercised during the year ¹⁸	Share options unvested as at 31 December	Share options vested as at 31 December
F.C.H. Roerink, former CFO	ESOP	4/11/2010	4/11/2013	10 years	0.10	16,500	(16,500)	—	—	108,930	—	—
		30/11/2011	30/11/2014	10 years	0.10	90,000	(90,000)	—	—	560,851	—	—
		1/10/2015	15/3/2017	10 years	0.10	14,300	(14,300)	—	—	84,272	—	—
		2/3/2017	15/3/2017	10 years	0.10	13,000	(13,000)	—	—	76,611	—	—
		28/3/2018	28/3/2021	8 years	5.34	18,333	(18,333)	—	—	997 ¹⁹	—	—
		16/5/2019	16/5/2022	8 years	2.60	13,333	—	—	—	—	—	13,333
		Total former Management Board members				165,467	(152,133)	—	—	831,662	—	13,333

¹⁸ The value of share options exercised during the year is expressed in EUR and is determined by the share price at exercise date less the exercise price.

¹⁹ The exercise of this series resulted in limited proceeds due to the series not being in the money at the time of exercise.



Management Board Remuneration 2022

The Remuneration Committee intended to propose, if necessary, a revision of this remuneration policy in 2022. After careful consideration, the Remuneration Committee concluded not to endorse any revisions this year. Revisions would primarily comprise adjustments resulting from the Committee's due consideration to the feedback from shareholders on the Remuneration Report 2020 and the remuneration policy for the members of the Management Board and the Supervisory Board. The Remuneration Committee concluded that the adjusted approach in reporting, including its level of reporting transparency on target setting and achievement, may for this year be addressed in the Remuneration Report 2021. It furthermore concluded that given that the Management Board's and senior management's remuneration continues to fall within a competitive range of approximately 20% around the median market levels payable within the reference groups of industrial companies in our sector, no adjustments are proposed at this time.

For 2022, salary increases for the Management Board and senior management are not yet considered; such may be addressed in due course.

As per the Remuneration Policy, the performance measures form a balanced mix of strategic, commercial and operational performance targets, which together ensure a focus on both the (financial) performance of the company in the short term and the sustained company future in reaching its long-term strategic objectives.

Based on feedback from shareholders on the remuneration policy and the Remuneration Report 2020, as discussed during and after the General Meeting of 2021, the Remuneration Committee reviewed Avantium's decision to be restrictive on the disclosure of the Management Board's exact actual targets, both in advance and retrospectively in view of the Remuneration Committee's assessment of the targets' realisation. Although it maintains its view that these qualify as strategically and commercially sensitive information, the Committee realises that more transparency towards its external stakeholders is strongly desired, in order, among other reasons, to confirm that the targets set are fully in line with the long-term strategy of Avantium to maximise the value of its technologies.

For 2022, the targets represent a list of long- and short-term goals that are aligned with the company's execution of its strategy. As an important element thereof, these goals should drive the company's performance on environmental, social and governance (ESG) criteria. As a technology leader in sustainable and circular chemicals and plastics, Avantium aims to meet ESG standards and plans to report in a transparent way its progress on implementing its Sustainability Plan (Chain Reaction 2030). The Remuneration Committee therefore recommended to the Supervisory Board to include additional performance measures on ESG criteria in the performance measures mix.

For the annual bonus 2022, the performance measures therefore include ESG performance targets in addition to the mix of strategic, commercial and operational performance targets. Their focus and relative weighting will be as reflected in the below table:

Performance measure	CEO	CFO
Strategic	60%	40%
Commercial	15%	15%
Operational	15%	35%
ESG	10%	10%
Total performance	100%	100%

These targets are only being disclosed to the extent they are not share-price or competition sensitive. For this reason, some of these targets are reflected with a generic description.

The maximum achievable bonus for Tom van Aken is 70% of his annual base salary. The maximum achievable bonus for Bart Welten is 50% of his annual base salary.

Performance measure	Objective	Target
Strategic	Secure financing and partnerships	<ol style="list-style-type: none"> 1. Ensure that the group's business operations are timely, prudently and sufficiently funded, on the basis of obtaining the mandate from its shareholders to raise €45 million in equity capital and against satisfactory conditions. 2. Secure sustainable progress in the area of partnerships.
Strategic	Achieve strategic milestones	<ol style="list-style-type: none"> 1. Timely execute Financial Close following Renewable Polymers' positive FID. 2. Meet strategic milestones in relation to the Cosun Beet Company joint venture partnering.
Strategic	Business & Technology Planning	Meet strategic milestones in relation to Avantium's earlier-stage technologies.

Performance measure	Objective	Target
Commercial	Drive commercial performance	<ol style="list-style-type: none"> 1. Meet strategic milestones on Renewable Polymers offtake commitments. 2. Meet Catalysis business performance parameters.
Operational	Drive operational performance	<ol style="list-style-type: none"> 1. Meet EPC milestones and financials. 2. Meet Ray Technology operational milestones.
ESG	Chain Reaction 2030 implementation	<ol style="list-style-type: none"> 1. Ecological: complete certified LCAs for YXY Technology (PEF) and Ray Technology (plantMEG, plantMPG). 2. Operations: calculate direct GHG emissions from our Flagship Plant, pilot plants and laboratory activities and improve on the baseline. 3. Supply chain: develop and initiate a supplier code of conduct and product stewardship plan. 4. People: establish a diversity and inclusion plan (including KPIs) and improve on the baseline.
ESG	Safety and health	<ol style="list-style-type: none"> 1. Safety #1 organisation: 0 accidents using OSHA LTI classification. 2. Engage staff and minimise staff turnover <10% (FY).

Supervisory Board Remuneration 2021

Remuneration Policy for the Supervisory Board

The remuneration of the members of the Supervisory Board consists of the following components:

- annual fee;
- travel expenses and other expenses; and
- one-off fixed awards of Options (ESOP) related to the member’s appointment.

i) Annual Fee

The remuneration policy determines the annual (gross) fees for each position of the Supervisory Board, separated into membership and chairpersonship of the Supervisory Board and membership and chairpersonship of a committee.

In line with the remuneration policy, the members of the Supervisory Board received the following annual (gross) fees:

- Membership of the Supervisory Board: €40,000;
- Chairpersonship of the Supervisory Board: €35,000 (additional);
- Membership of a committee of the Supervisory Board: €5,000 (per committee); and
- Chairpersonship of the Audit Committee of the Supervisory Board: €5,000 (additional).

The table hereafter provides a breakdown of the Supervisory Board members’ remuneration in 2021.

Avantium does not grant any personal loans, guarantees or advance payments to members of the Supervisory Board.

ii) Travel Expenses and Other Expenses

Supervisory Board members are reimbursed for all reasonable costs incurred in connection with their attendance of meetings. Travel costs are reimbursed in line with Avantium’s travel policy. Any other expenses are only reimbursed, either in whole or in part, if incurred with the prior consent of the Chair of the Supervisory Board. Over the year 2021, physical attendance of meetings was reduced to a minimum in light of the COVID-19 pandemic. Travel costs were therefore limited.

iii) One-Off Fixed Awards of Options (ESOP) Related to the Member’s Appointment

The members of the Supervisory Board may participate in the ESOP. Options are awarded under the ESOP upon a member’s appointment, or as per date of adoption of the proposed remuneration policy for the current members of the Supervisory Board, whereby the Chair of the Supervisory Board is entitled to eighty-five thousand (85,000) Options, and the other members of the Supervisory Board are entitled to thirty thousand (30,000) Options. A member may choose not to receive the award.

Based on the feedback by shareholders on the remuneration policy and the Remuneration Report 2020, as discussed prior to and after the General Meeting of 2021, the vesting period of the Options requires a clarification. The Options vest at the end of a three-year vesting term and not on an annual pro rata basis during this three-year vesting period. Only if the membership of a member of the Supervisory Board is terminated or has ended prior to the date of vesting will the number of options be decreased as provided for in the ESOP (on an annual pro rata basis during a period of three years). A lock-up period of four (4) years applies from the date of the award, with the exception of a limited right of sale for sell to cover purpose.

The exercise period of the Options will be up to four (4) years after the date that the awarded Options have fully vested.

Total Overview of Supervisory Board Remuneration 2021

(In €1,000)	Fixed remuneration		Variable remuneration		Total remuneration	% of fixed remuneration	% of variable remuneration
	Membership ²⁰	Committees	Other compensation ²¹	Long-term award ²²			
E. Moses	66	13	—	42	121	65%	35%
M.B.B. Jou	40	15	—	15	70	79%	21%
C.A. Arnold	35	13	5	—	53	91%	9%
M.G. Kleinsman	40	10	—	—	50	100%	—%
G.E. Schoolenberg	35	9	—	—	44	100%	—%
Total - 2021	216	60	5	57	338	82%	18%

The following table provides detail on the total remuneration received by each Supervisory Board member in accordance with the period the company's shares are traded on Euronext:

(In €1,000)	2021	2020	2019	2018	2017
E. Moses	121	133	3	—	—
M.G. Kleinsman	50	50	50	50	27
M.B.B. Jou	70	47	—	—	—
C.A. Arnold	53	14	—	—	—
G.E. Schoolenberg	44	13	—	—	—
Total Supervisory Board members	338	257	53	50	27
Remuneration of former Supervisory Board members					
D.J. Lucquin (member until 30 September 2020)	—	44	50	50	53
R.W. van Leen (member until 31 December 2019)	—	—	30	—	—
K. Verhaar (member until 20 December 2019)	—	—	90	80	6
G.E.A. Rijnen (member until 15 May 2019)	—	—	21	55	50
J.S. Wolfson (member until 15 May 2019)	—	—	18	50	45
Total former Supervisory Board members	—	44	209	235	154
Total remuneration	338	301	262	285	181

²⁰ The membership fee excludes the fee covering the onboarding period prior to the respective appointments, being equal to the prorated base membership fee (€40,000 on pro rata basis). The 2021 membership fees exclude the fees covering the onboarding period of Nils Björkman prior to his appointment, amounting to €13,000.

²¹ Other compensation includes expenditures related to travel.

²² Long-term award includes the value of the ESOP plan. The value of the ESOP reward is calculated based on the number of share options that have vested during the year and the net of the share price at vesting date less the exercise price.

Number of Options Supervisory Board

The main conditions of share option plans						
	Specification of plan	Award date	Vesting date	Exercise period	Exercise price of the option in EUR	
E. Moses	ESOP	14/5/2020	14/5/2023	8 years	3.59	
M.B.B. Jou	ESOP	14/5/2020	14/5/2023	8 years	3.59	
C.A. Arnold	ESOP	30/9/2020	30/9/2023	8 years	5.78	
J.S. Wolfson (former member)	ESOP	2/3/2017	2/3/2020	10 years	9.80	
J.M. van der Eijk (former member)	ESOP	2/3/2017	2/3/2020	10 years	9.80	

Information regarding the reported financial year										
	Specification of plan	Number of options outstanding 1 January	Share options granted during the year	Share options exercised during the year	Share options forfeited during the year	Share options vested during the year	Value of share options vested during the year ²³	Value of share options exercised during the year ²⁴	Share options unvested as at 31 December	Share options vested as at 31 December
E. Moses	ESOP	85,000	—	—	—	28,333	41,954	—	37,778	47,222
M.B.B. Jou	ESOP	30,000	—	—	—	10,000	14,807	—	13,333	16,667
C.A. Arnold	ESOP	30,000	—	—	—	10,000	—	—	16,667	13,333
J.S. Wolfson (former member)	ESOP	4,000	—	—	—	—	—	—	—	4,000
J.M. van der Eijk (former member)	ESOP	4,000	—	—	—	—	—	—	—	4,000
Total Supervisory Board members		145,000	—	—	—	48,333	56,761	—	67,778	77,222
Total former Supervisory Board members		8,000	—	—	—	—	—	—	—	8,000

As per 31 December 2021, the following Supervisory Board members held Options:

- Edwin Moses, Chair of the Supervisory Board: eighty-five thousand (85,000) options;
- Michelle Jou, member of the Supervisory Board: thirty thousand (30,000) options; and
- Cynthia Arnold, member of the Supervisory Board: thirty thousand (30,000) options.

Margret Kleinsman and Trudy Schoonenberg chose not to receive the award.

²³ The value of share options vested during the year is expressed in EUR and is determined by the share price at vesting date less the exercise price.

²⁴ The value of share options exercised during the year is expressed in EUR and is determined by the share price at exercise date less the exercise price.



Deviation from the Dutch Corporate Governance Code Best Practice Provision 3.3.2

Best Practice Provision 3.3.2 states that Supervisory Board members may not be awarded remuneration in the form of shares and/or rights to shares. However, Avantium believes that the remuneration package for its Supervisory Board members should enable Avantium to attract and retain top talent – and the right balance of personal skills, competences and experience – in a competitive and global environment. This enables the Supervisory Board to focus on the creation of sustainable added value and to oversee Avantium's (execution of its) long-term strategy and performance. This one-off fixed award of share options contributes to the long-term value creation of Avantium and serves as a long-term investment in Avantium, aiming to align the members' respective interests with those of the other shareholders. Based on the feedback from shareholders on the remuneration policy and the Remuneration Report 2020, as discussed prior to and after the General Meeting of 2021, the company, in particular the Remuneration Committee, understands that this deviation from the Dutch Corporate Governance Code Best Practice Provision 3.3.2 continues to be a controversial remuneration topic. The company would like to continue the dialogue on this topic in view of an updated remuneration policy.



Corporate Governance

Overview

Avantium N.V. is a Dutch public limited company based and registered in Amsterdam, the Netherlands. It acts as the holding company for its Dutch operating companies: Avantium Renewable Polymers, Avantium Renewable Chemistries and Avantium Catalysis. Avantium's shares are listed on Euronext Amsterdam and Euronext Brussels (symbol: AVTX).

We have a two-tier governance structure consisting of the Management Board and the Supervisory Board. There is also a third governing body: the General Meeting. In the following sections, we provide information on these governing bodies and their responsibilities and duties.

Since the financial year 2017, Avantium has been subject to the Dutch Corporate Governance Code (the Dutch Code), as amended and published on 8 December 2016. The Dutch Code contains principles and best practice provisions for management boards, supervisory boards, shareholders, general meetings of shareholders and audit and financial reporting. Below, we give information on how Avantium applies the Dutch Code.

Avantium's corporate governance framework is based on the requirements of the Dutch Civil Code, the Dutch Code, the company's Articles of Association of 14 March 2017, the applicable securities laws and the regulations concerning the Management Board and the Supervisory Board. Our Articles of Association, which are published online, include most of the Dutch Code's principles and best practice provisions applicable to a two-tier governance structure.

Management Board

The Management Board is the statutory executive body. Together with the Management Team, it is responsible for the day-to-day management of Avantium. It formulates the company strategy and policies and takes responsibility for internal control systems. The Management Board's duties may be divided among its members.

The Management Board may take any actions necessary or useful for achieving Avantium's objectives, except those prohibited by or expressly attributed to the General Meeting or Supervisory Board by law or by the Articles of Association.

In performing its duties, the Management Board must consider the interests of Avantium's stakeholders (including shareholders, employees, partners and customers) as well as the corporate social responsibility issues relevant to the business.

The Management Board must submit certain important decisions to the Supervisory Board or the General Meeting for approval. The Management Board must, in a timely way, provide the Supervisory Board with all the information it needs to carry out its own duties.

At least once a year, the Management Board evaluates itself and its individual members. The performance of the Management Board and its individual members is also evaluated at every closed session of the Supervisory Board, and the findings are communicated by the Chairperson to the Management Board.

Supervisory Board

The Supervisory Board supervises and advises the Management Board and guides the general course of company affairs and business. In performing their duties, the Supervisory Board members act in accordance with the interests of the company, considering stakeholder interests as well as the relevant corporate social responsibility issues.

The Supervisory Board is responsible for nominating and supervising an external accountant who audits, reports on and issues a statement concerning the company's annual financial statements to the General Meeting.

The Supervisory Board consists of at least three members and is authorised to make binding nominations for the appointment of a Supervisory Board member. It appoints one of its members to be Chairperson.

Each member is appointed for no more than four years, with their appointment period ending immediately after the General Meeting held in the fourth calendar year after their initial appointment. The Supervisory Board member may then be reappointed for up to two further two-year periods. For an appointment to continue beyond eight years, justification should be given in the consultative Report of the Supervisory Board.

At least once a year, the Supervisory Board evaluates its own performance as well as the performance of its Committees, the Management Board and all individual members thereof.



Supervisory Board Committees

The Supervisory Board's Audit Committee, Industrialisation Committee, Remuneration Committee and Nomination Committee advise the Supervisory Board and inform its decision-making, although the Supervisory Board remains collectively responsible for the fulfilment of the duties delegated to its committees. The Committee Regulations are published on Avantium's [website](#).

Audit Committee

The Audit Committee assists the Supervisory Board in overseeing the integrity and quality of the financial reporting and the effectiveness of the internal risk management and control systems, including supervising the enforcement of the relevant legislation and regulations, and supervising the effect of codes of conduct. The Audit Committee supervises the financing of the company. It assesses the external audit process and the scope and approach of the external auditor, and monitors progress and performance. The relationship with the external auditor is evaluated annually. Together with the Management Board, the Audit Committee reviews half-year and full-year financial statements, independent auditor's reports and the Management Letter. The Audit Committee supervises the company's policy on tax planning and the applications of information and communication technology (ICT), including risks relating to cybersecurity.

Remuneration Committee

The Remuneration Committee reviews and makes recommendations regarding the remuneration policy for the Management Board and the Supervisory Board, for adoption by the General Meeting. The approved policy then forms the basis for the fixed and variable remuneration of the Management Board.

Nomination Committee

The Nomination Committee is tasked with advising on candidates to fill vacancies in the Management Board and Supervisory Board, assessing the functioning of both Boards and their members, supervising the policy of the Management

Board on the selection criteria and appointment procedures for senior management and ensuring long-term succession planning.

Industrialisation Committee

The Industrialisation Committee has been established to serve as the Supervisory Board's advisory and risk review forum in providing oversight of the company's (i) technology strategy, (ii) industrialisation roadmaps and (iii) technology portfolio, all as determined, formulated and executed by the company's Management Board and senior management.

Technology Board

The Technology Board acts in an advisory capacity to the Management Board and senior management concerning the company's technology strategy and innovation portfolio. The Technology Board reviews and provides guidance on technology strategy and materially significant aspects of technology management, such as technology priorities and the execution of the company's portfolio of its technology projects.

The Technology Board comprises of independent experts with relevant expertise and experience. Technology Board members shall be considered subject matter experts in areas such as: innovation management, chemistry, chemical engineering, polymer development, (renewable) feedstocks and project and operations management, and/or have a relevant network in the chemical, polymer, renewables, engineering, manufacturing or related industries.

Board Compliance

Both the Management Board and the Supervisory Board, including the committees of the Supervisory Board, have their own regulations, which set rules regarding duties and responsibilities, composition and working methods. These regulations are available on our [website](#).

In line with the Supervisory Board Regulations, the Management Board Regulations and the Dutch Code, Board members must immediately report any real or potential conflict of interest to the Chair of the Supervisory Board and/or to the other members of the Management Board.

Diversity Policy

Avantium aspires to be an inclusive and diverse company with an open and inspiring culture, where people feel safe to develop and share ideas. The Avantium Diversity & Inclusion Policy is published on our [corporate website](#).

The Supervisory Board seeks to promote diversity among its members in terms of age, sex, nationality, experience within the industry, background, skills, knowledge and insights. As far as possible, we aim to create a balance among the Supervisory Board's members where this diversity is represented. The objective is to comply with the Supervisory Board Profile that can be found on Avantium's [website](#).

In 2021, the percentage of women on the Supervisory Board was 80%. At the Extraordinary General Meeting of Shareholders on 25 January 2022, a new male candidate was appointed as a sixth member of the Supervisory Board, complying with the target of at least 30% male or female Supervisory Board members prescribed by Dutch legislation on gender balance.

Annual General Meetings of Shareholders

An Annual General Meeting of Shareholders (General Meeting) is held within six months of the end of every financial year. The general purpose is to discuss the Board report, to discuss and adopt the financial statements and to discharge the Management Board members and the Supervisory Board members of their respective management and supervision duties. Extraordinary General Meetings (EGMs) are held if the Management Board and Supervisory Board deem it necessary



or at the request of one or more shareholders who, alone or jointly, represent at least one-tenth of Avantium's issued share capital.

A General Meeting is called by a convening notice sent by the Management Board or the Supervisory Board. Shareholders who, alone or jointly, represent at least 0.03% of the company's issued capital may ask for items to be added to the agenda.

Every shareholder may attend, speak and vote at the General Meeting. Unless Dutch law or the Articles of Association require a larger majority, resolutions of the General Meeting are adopted by a simple majority of votes cast. Certain resolutions require a qualified majority of two-thirds of the votes cast, if less than half of the issued share capital is represented at the General Meeting.

Corporate Governance Statement

Avantium acknowledges the importance of good corporate governance and agrees with the principles of the Dutch Code. We have taken, and will take, further appropriate steps to apply its principles and best practice provisions.

Compliance with the Dutch Code

Avantium is committed to applying the principles and best practice provisions of the Dutch Code. Below, we list the principles and best practice provisions where we deviate from the Dutch Code.

Principle 1.3: Internal Audit Function

The internal audit function assesses the design and operation of the internal risk management and control systems. The Management Board is responsible for the internal audit function; the Supervisory Board oversees this function and maintains regular contact with the people involved. In 2021, the duties and responsibilities of the internal audit function were allocated to various senior support staff functions within the company (e.g., Legal and Finance). These support staff

functions have direct access to the Audit Committee and the external auditor. Minutes are taken to record how the Audit Committee is informed by the internal audit function. The Supervisory Board annually assesses whether or not the allocation to various senior support functions within the company is still adequate.

Best Practice Provision 3.3.2: Remuneration of Supervisory Board Members

This provision states that Supervisory Board members may not receive remuneration in the form of shares and/or rights to shares. To continue to attract and retain top talent in a competitive global environment, and to help the Supervisory Board create sustainable added value, Avantium introduced, in view of the initial public offering (IPO), a renewed Employee Share Option Plan (ESOP) in 2016. Approval was given at the EGM on 10 February 2017, and this was confirmed by the adoption of the Remuneration Policy for the Supervisory Board at the Annual General Meeting of Shareholders on 14 May 2020.

As per the Remuneration Policy, Supervisory Board members may be awarded share options upon their appointment. Reference is made to the Remuneration Policy for the Supervisory Board, in particular the remuneration component "one-off fixed awards of Options (ESOP) related to the member's appointment", as explained in the [Remuneration Report](#).

Based on feedback by shareholders on the Remuneration Policy and the Remuneration Report 2020, as discussed during and after the General Meeting of 2021, the company reviewed its position related to Best Practice Provision 3.3.2: Remuneration of Supervisory Board Members. In submitting a proposal to the General Meeting on the designation of the Management Board to issue ordinary shares in connection with the company's long-term incentive and share-based compensation plans, the company will not make use of any such authority in view of this one-off fixed award of Options to a member's appointment. Instead, when submitting a proposal for appointment of a new Supervisory Board member, the Management Board will separately seek authority to issue ordinary shares in view of this one-off fixed award of Options to such new member.

Best Practice Provision 4.3.3: Cancelling the Binding Nature of a Nomination or Dismissal

This provision states that General Meetings of a company that does not have statutory two-tier status (structuurregime) may, by an absolute majority of the votes cast, cancel the binding nature of a nomination for the appointment and/or dismissal of a Management Board or Supervisory Board member. It may be provided that this majority should represent a given proportion (maximum one-third) of the issued capital. If this proportion is not represented at the meeting, but an absolute majority of the votes cast is in favour of a resolution to cancel the binding nature of a nomination or dismissal, a new General Meeting may be convened where the resolution may be passed by an absolute majority of the votes cast, regardless of the proportion of the capital represented at the new meeting.

Avantium's Articles of Association allow the Supervisory Board to make binding nominations. If it makes a binding nomination for the appointment of a Management Board or Supervisory Board member, the nominee shall be appointed regardless of the majority of the votes cast in favour. The General Meeting may override the binding nature of such a nomination by a majority of two-thirds of the votes cast, when these votes represent more than half of the issued share capital.

If the Supervisory Board has not made a binding nomination, the General Meeting can appoint a member of the Management Board or Supervisory Board at its discretion by a simple majority representing at least one-third of the issued share capital. In line with the company's Articles of Association, the General Meeting may at any time dismiss a member of the Management Board or the Supervisory Board. To pass, the resolution needs a two-thirds majority of the votes cast, representing more than half of the issued share capital. However, if the dismissal is proposed by the Supervisory Board, a simple majority is sufficient. Avantium deviates from the Dutch Code on this provision in order to safeguard the continuity of the company.



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Consolidated Financial Statements 2021

Consolidated Statement of Financial Position

As at December 31

in Euro x 1,000	Notes	2021	2020
ASSETS			
Non-current assets			
Property, plant and equipment	5	23,324	25,198
Intangible assets	6	1,835	559
Right-of-use assets	7	9,479	9,042
Total non-current assets		34,638	34,799
Current assets			
Inventories	8	1,238	1,225
Trade and other receivables	9	6,888	7,333
Cash and cash equivalents	10	34,911	26,626
Total current assets		43,037	35,184
Total assets		77,675	69,983

in Euro x 1,000	Notes	2021	2020
EQUITY			
Equity attributable to owners of the parent			
Ordinary shares	11	3,129	2,591
Share premium		230,252	204,296
Other reserves	11	11,936	10,407
Accumulated losses		(195,291)	(171,057)
Total equity attributable to the owners of the parent		50,026	46,238
Total equity		50,026	46,238
LIABILITIES			
Non-current liabilities			
Lease liabilities	7	9,099	8,003
Total non-current liabilities		9,099	8,003
Current liabilities			
Lease liabilities	7	1,604	1,703
Trade and other payables	14	16,750	13,894
Provisions for other liabilities and charges	16	196	145
Total current liabilities		18,550	15,742
Total liabilities		27,649	23,745
Total equity and liabilities		77,675	69,983

The accompanying notes are an integral part of these consolidated financial statements.

Consolidated Statement of Comprehensive Income

For the financial year ended December 31

in Euro x 1,000	Notes	2021	2020
Revenues	17	10,917	9,863
Other income	18	6,686	8,403
Total revenues and other income		17,603	18,266
Operating expenses			
Raw materials and contract costs	20	(3,042)	(2,339)
Employee benefit expenses	21	(19,226)	(19,262)
Office and housing expenses	20	(1,968)	(1,990)
Patent, license, legal and advisory expenses	20	(4,312)	(4,204)
Laboratory expenses	20	(2,864)	(3,664)
Advertising and representation expenses	20	(707)	(679)
Reversal due for onerous contract	7	—	492
Other operating expenses	20	(1,568)	(1,528)
Net operating expenses		(33,687)	(33,173)
EBITDA		(16,084)	(14,907)
Depreciation, amortisation and impairment charge	20	(7,837)	(7,597)
EBIT²⁵		(23,921)	(22,504)
Finance income	22	2	37
Finance costs	22	(497)	(362)
Loss before income tax		(24,416)	(22,830)
Income tax expense	23	—	—
Loss for the period		(24,416)	(22,830)

in Euro x 1,000	Notes	2021	2020
Other comprehensive income		—	—
Total comprehensive expense for the year		(24,416)	(22,830)
Loss attributable to:			
Owners of the parent		(24,416)	(22,830)
Total comprehensive expense attributable to:		(24,416)	(22,830)
Owners of the parent		(24,416)	(22,830)

in Euro	Note	2021	2020
Earnings per share for loss from continuing operations attributable to the ordinary equity holders of the company			
Basic earnings per share	13	(0.82)	(0.88)
Diluted earnings per share	13	(0.82)	(0.88)
Earnings per share for loss attributable to the ordinary equity holders of the company			
Basic earnings per share	13	(0.82)	(0.88)
Diluted earnings per share	13	(0.82)	(0.88)

The accompanying notes are an integral part of these consolidated financial statements.

²⁵ EBIT: Earnings Before Interest and Taxes is used in the annual report as a measure, since it provides a view on the core operations of the company alone without the capital structure and tax expenses.



Consolidated Statement of Changes in Equity

For the year ended December 31

in Euro x 1,000	Attributable to equity holders of the company				
	Ordinary shares	Share premium	Other reserves	Accumulated losses	Total Equity
Balance at 1 January 2020	2,583	204,296	9,863	(148,527)	68,215
Comprehensive expense					
Result for the year	—	—	—	(22,830)	(22,830)
Other Comprehensive expense for the year	—	—	—	—	—
Total Comprehensive expense for the year	—	—	—	(22,830)	(22,830)
Transactions with owners					
▪ Employee share schemes - value of Employee services	—	—	702	—	702
▪ Employee share schemes- LTIP investment shares granted	—	—	137	—	137
▪ Transfer value share scheme to accumulated losses	—	—	(300)	300	—
▪ Issue of ordinary shares	8	—	—	—	8
▪ Shares delivered from treasury shares	—	—	5	—	5
Total transactions with owners	8	—	545	300	852
Balance at 31 December 2020	2,591	204,296	10,407	(171,057)	46,238

in Euro x 1,000	Attributable to equity holders of the company				
	Ordinary shares	Share premium	Other reserves	Accumulated losses	Total Equity
Balance at 1 January 2021	2,591	204,296	10,407	(171,057)	46,238
Comprehensive expense					
Result for the year	—	—	—	(24,416)	(24,416)
Other Comprehensive expense for the year	—	—	—	—	—
Total Comprehensive expense for the year	—	—	—	(24,416)	(24,416)
Transactions with owners					
▪ Employee share schemes- value of Employee services	—	—	828	—	828
▪ Share-based payment - purchase of intangible assets	—	—	884	—	884
▪ Transfer value share scheme to accumulated losses	—	—	(183)	183	—
▪ Issue of ordinary shares from the capital raise	521	25,855	—	—	26,376
▪ Issue of ordinary shares from share option plan	17	101	—	—	117
Total transactions with owners	537	25,956	1,528	183	28,205
Balance at 31 December 2021	3,129	230,252	11,936	(195,291)	50,026

The accompanying notes are an integral part of these consolidated financial statements.



Consolidated Statement of Cash Flows

For the year ended December 31

in Euro x 1,000	Notes	2021	2020
Cash flows from operating activities			
Loss for the year from continuing operations		(24,416)	(22,830)
Adjustments for:			
▪ Depreciation of property, plant and equipment	5	5,778	5,818
▪ Amortisation	6	56	152
▪ Depreciation of right of use assets	7	2,003	1,589
▪ Share-based payment	12	1,711	839
▪ Finance costs - net	22	495	325
▪ Non cash portion of onerous contract reversal	7	—	(492)
▪ Impairment of property, plant and equipment	5	22	38
▪ Lease adjustment		28	—
Changes in working capital (excluding exchange differences on consolidation):			
▪ (Increase)/decrease in inventories	8	(12)	215
▪ Decrease in trade and other receivables	9	456	4,251
▪ Increase/(decrease) in trade and other payables	14	1,429	(3,228)
▪ Increase in provisions	16	51	7
		(12,398)	(13,315)
Interest paid on current accounts	22	(120)	(69)
Interest received on current accounts	22	2	37
Other interest and bank charges		(94)	(72)
Net cash used in operating activities		(12,610)	(13,419)

in Euro x 1,000	Notes	2021	2020
Cash flows from investing activities			
Purchases of property, plant and equipment (PPE)	5	(3,926)	(3,425)
Purchases of intangible assets	6	(6)	(27)
Net cash used in investing activities		(3,932)	(3,453)
Cash flow from financing activities			
Net proceeds from Capital raise		26,376	—
Net proceeds of option exercises		117	—
Principal elements of lease payments	7	(1,663)	(1,946)
Net cash generated from/(used in) financing activities		24,830	(1,946)
Net increase/(decrease) in cash and cash equivalents		8,288	(18,817)
Cash and cash equivalents at beginning of the year	10	26,626	45,443
Effect of exchange rate changes	22	(2)	(1)
Cash and cash equivalents from continuing operations at end of financial year	10	34,911	26,626
Cash and cash equivalents at end of financial year	10	34,911	26,626

The accompanying notes are an integral part of these consolidated financial statements.



Main Notes to the Consolidated Financial Statements

1. General Information

Avantium N.V. ('the company') is a company incorporated and domiciled in the Netherlands, with its statutory seat at Zekeringstraat 29-31, 1014 BV in Amsterdam. The company is listed on Euronext Amsterdam and Brussels. The consolidated financial statements of the company for the year ended 31 December 2021 comprise of the company and its subsidiaries (together referred to as 'the group'). The company is also the ultimate parent of the group.

The company is primarily involved in developing and commercialising next generation bio-based plastics and chemicals based on our unique technological capabilities in advanced catalysis research & development. Avantium also provides advanced catalysis R&D services and systems (such as our Flowrence systems) to customers in the refinery and chemical industries.

For setting the principles for the recognition and measurement of assets and liabilities and determination of the result of its company financial statements, Avantium N.V. makes use of the option provided in Section 2:362 (8) of the Dutch Civil Code. This means that the principles of the recognition and measurements of assets and liabilities and determination of the result (hereafter referred to as accounting policies) of the company financial statements of Avantium N.V. are the same as those applied for the consolidated financial statements under IFRS (refer to note 2). By applying this option, reconciliation is maintained between the group's and the company's equity.

These consolidated financial statements were approved for issue by both the Supervisory Board and the Management Board on 22 March 2022.

2. Summary of Significant Accounting Policies

The principal accounting policies applied in the preparation of these consolidated financial statements are set out below. These policies have been consistently applied to all the years presented, unless otherwise stated.

2.1. Basis of Preparation

The consolidated financial statements of Avantium N.V. have been prepared in accordance with International Financial Reporting Standards (IFRS) as adopted by the European Union. The consolidated financial statements have been prepared under the historical cost convention unless otherwise stated.

2.1.1 Going Concern

The financial statements have been prepared on a going concern basis.

Avantium N.V. ("Avantium")

Avantium is a leading technology company in renewable chemistry, dedicated to developing and commercialising breakthrough technologies for the production of chemicals from renewable sources and circular plastic materials.

Avantium consists of the three business segments in various stages of maturity, Avantium Catalysis, Avantium Renewable Polymers and Avantium Renewable Chemistries:

Avantium Catalysis: Our main revenue generating business unit is Catalysis Services & Systems which serves the R&D catalysis needs of international blue-chip players.

Avantium Renewable Polymers commercialises its YXY Technology for the production of FDCA (furandicarboxylic acid), which is a key ingredient for PEF (polyethylene furanoate). PEF is a novel 100% plant-based and fully recyclable polymer, which has the potential to outperform today's packaging materials, such as plastic, glass and aluminum. PEF has huge potential in the packaging, film and textile sectors, which are large and growing markets. Avantium Renewable Polymers has operated a pilot plant in Geleen as of 2011 and is planning to build its full scale Flagship Plant at the Groningen SeaPorts site in Groningen. This Flagship Plant will operate at commercial scale and will further support Avantium Renewable Polymers's licensing strategy. We expect that construction of the Flagship Plant for FDCA will start in April 2022 and will be completed by Q4 2023.

Avantium Renewable Chemistries develops, among other technologies, plantMEG™ (mono-ethylene glycol), which is a plant-based, fully recyclable and competitive alternative for fossil-based MEG. This is an important chemical building block for PET and PEF resin, both of which are used in



bottles and packaging; fibres for clothing, furniture and the automotive industry; and solvents and coolants. Avantium Renewable Chemistries opened a demonstration plant in Delfzijl in 2019, which was successfully commissioned and became fully operational in 2020. Avantium plans to scale-up the plantMEG™ technology in order to subsequently implement its licensing business model.

Funding Avantium

Due to its nature as a technology development company, with significant R&D expenses and negative cash flows over 2021 of €-18.1 million (2020: €-18.8 million) and in the near future, Avantium remains dependent on additional external funding. Fundamental to Avantium's continuity is:

- the construction of the FDCA flagship plant for Avantium Renewable Polymers, for which financing is arranged and expected to be effectuated at Financial Close planned by April 2022; and
- the funding for Avantium as a group excluding Renewable Polymers which includes further development of Avantium's other technologies. This funding has not been secured yet.

Failure to achieve new funding in a timely fashion may result in the company being unable to fulfil its obligations or to fund capital expenditure and working capital, all of which are necessary to execute the company's strategy, retain contract partners, retain key employees and meet our payment obligations. Without timely funding, the company's going concern is at risk.

These events indicate the existence of a material uncertainty that may cast significant doubt on Avantium's ability to continue as a going concern and therefore, that it may be unable to realise its assets and discharge its liabilities in the normal course of businesses.

In light of the above, management has assessed the going concern assumption on the basis of which Avantium's financial statements for 2021 have been prepared.

FDCA Flagship Plant Business Plan Avantium Renewable Polymers

On 9 December 2021, Avantium announced that it had taken a positive Final Investment Decision (FID) to construct the FDCA Flagship Plant. The positive FID was taken after Avantium fulfilled all three key conditions: (i) obtaining sufficient offtake commitments (ii) finalising the engineering and establishing the supply chain, and (iii) obtaining sufficient financing.

On 9 December 2021, Avantium announced that it signed a detailed term sheet for a three-year debt financing package of €90 million with a consortium of lenders for the financing of the construction (including contingency) and the operational expenses until project completion date of the FDCA Flagship Plant of Avantium Renewable Polymers. The consortium of lenders comprise

four Dutch banks; (ABN AMRO Bank, ASN Bank, ING Bank and Rabobank) and the government backed Dutch impact investment fund Invest-NL. Each bank has committed €15 million under the debt financing, and Invest-NL has committed €30 million. The interest over this debt financing is EURIBOR based and is, at today's rates, approximately 8% on an annualized basis over the amounts drawn. With this €90 million debt financing, Avantium Renewable Polymers has now secured (subject to Financial Close) a total of €192.5 million funding, to be used for capital expenditure, start-up costs and working capital.

The total financing package of €192.5 million includes €27.5 million in grants ("PEference"-EU Horizon 2020 and the National Programme Groningen), €30 million in equity by minority shareholders Groningen consortium and Worley, €90 million in debt financing and an equity investment by Avantium in its subsidiary Avantium Renewable Polymers. Avantium agreed to invest an additional €10 million in equity in Avantium Renewable Polymers in order to absorb the additional costs of one year delay in taking the FID. This increase brings the total committed equity investment by Avantium in its subsidiary Avantium Renewable Polymers to €45 million.

Upon Financial Close, Avantium Renewable Polymers will be fully funded with the goal of becoming cash flow positive upon the start-up and scale-up of the production of FDCA and PEF at the Flagship Plant. All Financial close related agreements (offtake agreements, supply chain contracts, the engineering, procurement and construction contract and financing agreements) are subject to customary terms and conditions and will be effectuated at Financial Close. At the first drawdown of the loan, expected at the end of 2022, several conditions must be met. Avantium expects to successfully reach Financial Close by April 2022 and to fully secure funding for Avantium Renewable Polymers, and is confident that it is on track to meet all conditions and complete all documents required.

Financing Avantium excluding Renewable Polymers

Avantium N.V. cannot use above mentioned financing package, which will be ringfenced financing for Avantium Renewable Polymers, for its other business segments. For this reason, management also assessed its ability to obtain financing for the group's other technologies in order to assess the going concern assumption of the group.

Avantium's consolidated cash position was €34.9 million as at 31 December 2021. As at 31 December 2021, Avantium should still provide €18.5 million to Avantium Renewable Polymers based on the committed €45 million equity funding.

For the group, excluding Avantium Renewable Polymers, the monthly cash spend is forecasted at approximately €1.2 million per month. At Financial Close, which is planned by April 2022, the group excluding Avantium Renewable Polymers and remaining committed equity funding, expects to have a cash balance of approximately €12 million. Based on this assessment, it is management



expectation that there is enough cash to fund ongoing operations for a period of approximately 10 months as of the date of these financial statements, therefore additional funding will be required in the course of 2022.

Avantium has received a mandate to raise €45 million in equity capital from its shareholders at the Extraordinary General Meeting of Shareholders held on 25 January 2022.

Although management has not decided on the final transaction structure, it has a preference for a public offering. To that end, management is regularly engaging with existing and potential new investors. Management has also appointed a syndicate of banks to manage the capital raise and the process is already underway. Management is fully focused on the careful planning and execution of all aspects of the proposed capital raise.

There is still however a possibility that recent geopolitical developments or unknown developments result in the capital raise not being successful, partially successful, or that the capital raise cannot be executed in an appropriate timeframe.

In case the capital raise cannot be executed in an appropriate timeframe for the full amount, management is exploring alternative sources of funding. Avantium is exploring multiple options to strengthen its financial position and evaluate strategic choices to execute its strategy. As such, Avantium is working on attracting additional sources of financing, consisting of a combination of equity and/or government grants to provide for the company's operations beyond 12 months. Furthermore, the company is always exploring possibilities for new grant applications on both a national and on European level in order to (partly) finance its technology development activities.

If the capital raise or the finding of alternative sources of funding are not successful, or materially delayed, this may result in uncertainty with regards to the agreed financing plan for Avantium Renewable Polymers, as the company and the banks, in that case, would not find it prudent to proceed with the debt financing arrangement. In that scenario, the company will have to implement substantial cost savings in both Avantium Renewable Polymers and other businesses to extend the cash run rate.

Based on management's analyses and assessments, although a material uncertainty remains for the company's going concern, management believes it is appropriate to prepare Avantium's financial statements using the going concern assumption.

2.1.2 Changes in Accounting Policy and Disclosures

New Standards, Amendments and Interpretations not yet Adopted

There were no changes to the financial reporting requirements this year that affected the disclosures in the financial statements of the Group.

New Standards, Amendments and Interpretations not yet Adopted

A number of new standards and amendments to standards and interpretations have been published that are not mandatory for 31 December 2021 reporting periods and have not been early adopted by the company. These standards are not expected to have a material impact on the company in the current or future reporting periods and on foreseeable future transactions.

Change in accounting policy

During 2021 management assessed the useful life of machinery, laboratory equipment and vehicles and determined the useful life should be amended to include a useful life period of up to 7 years, instead of only 5 years. The change in the accounting policy has no effect on prior or current years.

Use of Estimates

The preparation of financial statements in accordance with IFRS requires the use of certain accounting estimates. It also requires management to exercise its judgement in the process of applying the group's accounting policies. Estimates and judgments are continually evaluated, and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances.

2.2 Consolidation

2.2.1 Subsidiaries

Subsidiaries are all entities over which the group has control. The group controls an entity when the group is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. Subsidiaries are fully consolidated from the date on which control is transferred to the group. They are deconsolidated from the date that control ceases.

The consolidated companies are listed below:

- Avantium Technologies B.V., Amsterdam (100%)
- Avantium Support B.V., Amsterdam (100%)
- Renewable Technologies B.V. Amsterdam (100%)
- Avantium Chemicals B.V., Amsterdam (100%)
- Avantium Knowledge Centre B.V., Amsterdam (100%)



- Furanix Technologies B.V., Amsterdam (100%)
- YXY Technologies B.V., Amsterdam (100%)
- Stichting Administratiekantoor Avantium, Amsterdam (100%)
- Stichting Stock Options Avantium, Amsterdam (100%)
- Feedstock Technologies B.V., Amsterdam (100%)
- Avantium Renewable Polymers B.V., Amsterdam (100%)
- Avantium RNP Flagship Plant B.V., Amsterdam (100%)
- Avantium Japan K.K., Tokyo (100%)
- Synvina C.V., Amsterdam (100%)

On 23 September 2021, Avantium RNP Flagship B.V. was incorporated. Avantium Renewable Polymers B.V. obtained 100% shareholding in Avantium RNP Flagship B.V. and controls Avantium RNP Flagship B.V. as of the date of incorporation.

Inter-company transactions, balances and unrealised gains on transactions between group companies are eliminated. Unrealised losses are also eliminated. When necessary, amounts reported by subsidiaries have been adjusted to conform to the group's accounting policies.

2.2.2 Changes in Ownership Interests in Subsidiaries Without Change of Control

Transactions with non-controlling interests that do not result in loss of control are accounted for as equity transactions – that is, as transactions with the owners in their capacity as owners. The difference between fair value of any consideration paid and the relevant share acquired of the carrying value of net assets of the subsidiary is recorded in equity. Gains or losses on disposals to non-controlling interests are also recorded in equity.

2.2.3 Disposal of Subsidiaries

When the group ceases to have control, any retained interest in the entity is remeasured to its fair value at the date when control is lost with the change in carrying amount recognised in profit or loss. The fair value is the initial carrying amount for the purposes of subsequently accounting for the retained interest as an associate, joint venture or financial asset. In addition, any amounts previously recognised in other comprehensive income in respect of that entity are accounted for as if the group had directly disposed of the related assets or liabilities. This may mean that amounts previously recognised in other comprehensive income are reclassified to profit or loss.

2.2.4 Principles of Consolidation and Equity Accounting

When the group ceases to consolidate or equity account for an investment because of a loss of control, joint control or significant influence, any retained interest in the entity is remeasured to its fair value with the change in carrying amount recognised in profit or loss. This fair value becomes the initial carrying amount for the purposes of subsequently accounting for the retained interest as

an associate, joint venture or financial asset. In addition, any amounts previously recognised in other comprehensive income in respect of that entity are accounted for as if the group had directly disposed of the related assets or liabilities. This may mean that amounts previously recognised in other comprehensive income are reclassified to profit or loss.

If the ownership interest in a joint venture or an associate is reduced but joint control or significant influence is retained, only a proportionate share of the amounts previously recognised in other comprehensive income are reclassified to profit or loss where appropriate.

2.2.5 Segment Reporting

Operating segments are reported in a manner consistent with the business responsibilities and internal reporting. The Management Board has appointed the management team which assesses the financial performance and position of the group, and makes strategic decisions. The management team, consists of the Chief Executive officer, the Chief Financial Officer, the Chief Technology Officer, the Group Legal Counsel, the Managing Director of Avantium Renewable Chemistries, the Managing Director of Avantium Catalysis and the Managing Director of Avantium Renewable Polymers.

2.3 Foreign Currency Translation

Functional and Presentation Currency

Items included in the financial statements of each of the group's entities are measured using the currency of the primary economic environment in which the entity operates ('the functional currency'). The consolidated financial statements are presented in euros, which is the company's functional currency.

Transactions and Balances

Foreign currency transactions are translated into the functional currency using the exchange rates prevailing at the dates of the transactions or valuations where items are remeasured. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation at year-end exchange rates of monetary assets and liabilities denominated in foreign currencies are recognised in the statement of comprehensive income.

Foreign exchange gains and losses that relate to borrowings and cash and cash equivalents are presented in the statement of comprehensive income within 'finance income or cost'.

Group Companies

The results and financial position of all the group entities (none of which has the currency of a hyper-inflationary economy) that have a functional currency different from the presentation



currency are translated into the presentation currency as follows:

- Assets and liabilities for each balance sheet presented are translated at the closing rate at the date of that balance sheet.
- Income and expenses for each statement of comprehensive income are translated at the average exchange rates.
- All resulting exchange differences are recognised as a separate component of other comprehensive income.

2.4 Use of Estimates

The preparation of consolidated financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, disclosure of contingencies at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. The use of estimates is or could be a significant factor affecting the reported carrying values of property, plant and equipment, intangibles, trade and other receivables and trade and other payables. Despite management's best efforts to accurately estimate such amounts, future results could materially differ from those estimates.

2.5 Property, Plant and Equipment

Property, plant and equipment comprise mainly of laboratory equipment, hardware and leasehold improvements. Leasehold improvements include machinery that is located in at the various pilot plant sites. All property, plant and equipment is stated at historical cost less accumulated depreciation. Historical cost includes expenditures that are directly attributable to the acquisition of the items.

Subsequent costs are included in the asset's carrying amount or recognised as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to the group and the cost of the item can be measured reliably. All other repairs and maintenance charges are expensed in the financial period in which they are incurred.

Depreciation is calculated using the straight-line method to allocate their cost of the assets to their residual values over their estimated useful lives as follows:

- | | |
|--|------------|
| ■ Leasehold improvements | 5-20 years |
| ■ Machinery, laboratory equipment and vehicles | 5 -7 years |
| ■ Computer hardware | 3 years |
| ■ Office furniture and equipment | 3-5 years |

Gains and losses on disposals are determined by comparing the proceeds with the carrying amount. Gains and losses are included in the consolidated statement of comprehensive income.

2.6 Intangible Assets

Research and Development

Research expenditures are recognised as expenses as incurred. Development costs that are directly attributable to the design and testing of identifiable and unique products controlled by the group are recognised as intangible assets when the following criteria are fulfilled:

- It is technically feasible to complete the intangible asset so that it will be available for use or sale.
- Management intends to complete the intangible asset and use or sell it.
- There is an ability to use or sell the intangible asset.
- It can be demonstrated how the intangible asset will generate probable future economic benefits.
- Adequate technical, financial and other resources to complete the development and to use or sell the intangible asset are available.
- The expenditure attributable to the intangible asset during its development can be reliably measured.

Other development expenditures that do not meet these criteria are recognised as an expense as incurred. Development costs previously recognised as an expense are not recognised as an asset in a subsequent period. Capitalised development costs are recorded as intangible assets and amortised from the point at which the asset is ready for use on a straight-line basis over its estimated useful life of five years. Intangible assets not ready for use are tested for impairment at least on an annual basis.

Amortisation of development costs is included in depreciation, amortisation and impairment charge in the statement of comprehensive income. All development costs arose from internal development.

Computer Software and Other Intangibles

Acquired computer software licenses are capitalised on the basis of the costs incurred to acquire and use the specific software. These costs are amortised straight-line over their estimated useful lives of three years.

Costs associated with developing or maintaining computer software programmes are recognised as expenses as incurred. Development costs that are directly attributable to the design and testing of identifiable and unique software products controlled by the group, that will probably generate economic benefits exceeding costs beyond one year, are recognised as intangible assets.

Other intangibles consisting of an in-kind contribution of a shareholder for their software at the foundation of the group and compensation paid to a third party to exclusively use parts of their technology. Amortisation is calculated using the straight-line method over the estimated useful life of three years.



Intellectual Property

Following the acquisition of Liquid Light on 30 December 2016, the company records intellectual property (patent portfolio acquired) on its consolidated balance sheet. The intellectual property is stated at historical cost, which will subsequently be lowered with accumulated amortisation in the following years, when the technology on which the intellectual property is filed is ready to deploy commercially.

Subsequent costs are included in the asset's carrying amount or recognised as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to the group and the cost of the item can be measured reliably.

Amortisation is calculated using the straight-line method to allocate their cost of the assets to their residual values over their estimated useful lives (average lifetime of patent portfolio) as follows:

- Intellectual property 5-20 years

License rights

Acquired licenses that grants the company the right to use technologies not owned/developed by the company are recorded on its consolidated balance sheet. The license rights are stated at historical cost, which will subsequently be lowered with accumulated amortisation in the following years.

License rights contain variable royalty fee payment terms that are linked to production of the License Products once the FDCA Flagship Plant is constructed and starts production. The fees will equal to \$20 USD per metric ton of Licensed Products produced from the FDCA Flagship Plant. Variable royalty fee payments that depend on the volume of production of the Licensed Products will be recognised in profit or loss in the period in which the condition that triggers those payments.

Amortisation is calculated using the straight-line method to allocate their cost of the assets to their residual values over their estimated useful lives (average lifetime of license rights) as follows:

- License rights 5-20 years

2.7 Impairment of Non-Financial Assets

Assets that are subject to amortisation are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognised for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs to sell and value in use. For the purposes of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash flows (cash-generating units). Non-financial assets other than goodwill that suffered impairment are reviewed for possible reversal of the impairment at each reporting date.

2.8 Non-Current Assets (or Disposal Groups) Held for Sale

Non-current assets (or disposal groups) are classified as assets held for sale when their carrying amount is to be recovered principally through a sale transaction and a sale is considered highly probable. They are stated at the lower of carrying amount and fair value less costs to sell.

2.9 Financial Assets

2.9.1 Classification

The group classifies its financial assets in assets to be measured at amortised cost.

The classification depends on the company's business model for managing the financial assets and the contractual terms of the cash flows. Management determines the classification of its financial assets at initial recognition. The group classifies its financial assets as assets held for collection of contractual cash flows.

2.9.2 Recognition and Measurement

Regular purchases and sales of financial assets are recognised on the trade-date, the date on which the group commits to purchase or sell the asset. Financial assets are derecognised when the rights to receive cash flows from the financial assets expire or if the company transfers the financial asset to another party and does not retain control or substantially all risks and rewards of the asset. Financial liabilities are derecognised when the company's obligations specified in the contract expire or are discharged or cancelled.

Financial assets that are held for collection of contractual cash flows where those cash flows represent solely payments of principal and interest are measured at amortised cost. Interest income from these financial assets is included in finance income using the effective interest rate method. Any gain or loss arising on derecognition is recognised directly in the statement of comprehensive income and presented in other gains/ (losses). Impairment losses are presented as separate line item in the statement of comprehensive income.

2.10 Offsetting Financial Instruments

Financial assets and liabilities are offset and the net amount reported in the balance sheet when there is a legally enforceable right to offset the recognised amounts and there is an intention to settle on a net basis or realise the asset and settle the liability simultaneously. The legally



enforceable right must not be contingent on future events and must be enforceable in the normal course of business and in the event of default, insolvency or bankruptcy of the company or the counterparty.

2.11 Impairment of Financial Assets

Assets Carried at Amortised Cost

Impairment provisions for trade receivables are recognised based on the simplified approach within IFRS 9 to measuring expected credit losses which uses a lifetime expected loss allowance for all trade receivables and contract assets.

To measure the expected credit losses, trade receivables and contract assets have been grouped based on shared credit risk characteristics and the days past due. The contract assets relate to unbilled work in progress and have substantially the same risk characteristics as the trade receivables for the same types of contracts. The group has therefore concluded that the expected loss rates for trade receivables are a reasonable approximation of the loss rates for the contract assets.

If, in a subsequent period, the amount of the impairment loss decreases and the decrease can be related objectively to an event occurring after the impairment was recognised (such as an improvement in the debtor's credit rating), the reversal of the previously recognised impairment loss is recognised in the consolidated statement of comprehensive income.

Other assets are tested for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognised for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs of disposal. For the purposes of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash inflows which are largely independent of the cash inflows from other assets or groups of assets (cash-generating units).

2.12 Inventories

Inventories are stated at the lower of cost and net realisable value. Cost is determined using the first-in, first-out (FIFO) method. The cost of raw materials, finished goods and work in progress comprises all purchase costs including charges incurred to bring inventories to their current location and into their current state. It excludes borrowing costs. Net realisable value is the estimated selling price in the ordinary course of business, less applicable variable selling expenses.

2.13 Trade Receivables

Trade receivables are amounts due from customers for products sold or services performed in the ordinary course of business. If collection is expected in one year or less (or in the normal operating cycle of the business if longer), they are classified as current assets. If not, they are presented as non-current assets.

Trade receivables are recognised initially at fair value and subsequently measured at amortised cost using the effective interest method, less provision for impairment. Refer to note 2.11 for further information about the group's impairment policy on financial assets.

2.14 Cash and Cash Equivalents

In the consolidated statement of cash flows, cash and cash equivalents includes cash in hand, deposits held at call with banks, other short-term highly liquid investments with original maturities of three months or less and bank overdrafts. In the consolidated statement of financial position, bank overdrafts are shown within borrowings in current liabilities.

Restricted Cash

The restricted cash includes cash deposits, which is measured at an amount equal to the current outstanding bank guarantees issued to third parties. The restricted cash is not available for use by the company to meet the short-term cash obligations. In the consolidated statement of financial position the restricted cash is shown within cash and cash equivalents as current assets.

2.15 Share Capital

Ordinary Shares

Ordinary shares are classified as equity. Incremental costs directly attributable to the issue of new ordinary shares or options are shown in equity as a deduction, net of tax, from the proceeds.

Treasury Shares

Where any group company or liquidity provider appointed by the group, purchases the company's equity share capital (treasury shares), the consideration paid, including any directly attributable incremental costs (net of income taxes), is deducted from equity attributable to the company's equity holders until the shares are cancelled or reissued. Where such ordinary shares are subsequently reissued, any consideration received, net of any directly attributable incremental transaction costs and the related income tax effects, is included in equity attributable to the company's equity holders. No gain or loss is recognised in the statement of comprehensive income on the purchase, sale, issuance or cancellation of the company's own equity instruments.



2.16 Trade and Other Payables

Trade payables are obligations to pay for goods or services that have been acquired in the ordinary course of business from suppliers. Accounts payable are classified as current liabilities if payment is due within one year or less (or in the normal operating cycle of the business if longer). If not, they are presented as non-current liabilities.

Trade payables are recognised initially at fair value and subsequently measured at amortised cost using the effective interest method.

2.17 Current and Deferred Income Tax

The tax expense for the year comprises current and deferred tax. Tax is recognised in the statement of comprehensive income, except to the extent that it relates to items recognised in other comprehensive income or directly in equity. In this case, the tax is also recognised in other comprehensive income or directly in equity respectively.

The current income tax charge is calculated on the basis of the tax laws enacted or substantively enacted at the balance sheet date in the countries where the company's subsidiaries and associates operate and generate taxable income. Management periodically evaluates positions taken in tax returns with respect to situations in which applicable tax regulation is subject to interpretation. It establishes provisions where appropriate on the basis of amounts expected to be paid to the tax authorities.

Deferred income tax is recognised, using the liability method, on temporary differences arising between the tax bases of assets and liabilities and their carrying amounts in the consolidated financial statements. However, the deferred income tax is not accounted for if it arises from initial recognition of an asset or liability in a transaction other than a business combination that at the time of the transaction affects neither accounting nor taxable profit or loss. Deferred income tax is determined using tax rates (and laws) that have been enacted or substantially enacted by the balance sheet date and are expected to apply when the related deferred income tax asset is realised or the deferred income tax liability is settled.

Deferred income tax assets are recognised only to the extent that it is probable that future taxable profit will be available against which the temporary differences can be utilised.

Deferred income tax assets and liabilities are offset when there is a legally enforceable right to offset current tax assets against current tax liabilities and when the deferred income tax assets and liabilities relate to income taxes levied by the same taxation authority on either the taxable entity or different taxable entities where there is an intention to settle the balances on a net basis.

2.18 Employee Benefits

Pension Obligations

The group operates a defined contribution pension plan for all employees funded through payments to an insurance company. The group has no legal or constructive obligations to pay further contributions if the plan does not hold sufficient assets to pay all employees the benefits relating to employee service in the current and prior years. The contributions are recognised as employee benefit expense when they are due. Prepaid contributions are recognised as an asset to the extent that a cash refund or a reduction in the future payments is available.

Share-Based Payments

The group operates a share-based compensation plans for its employees, which consist of an Employee Stock Option Plan (ESOP) and a Long-term Incentive Plan (LTIP), also refer to note 12. These plans are classified as an equity-settled share-based payment plans.

Share options granted to employees are measured at the fair value of the equity instruments granted under the indirect method of measurement. Fair value is determined through the use of an option-pricing model considering, amongst others, the following variables:

- a) The exercise price of the option
- b) The expected life of the option
- c) The current value of the underlying shares
- d) The expected volatility of the share price
- e) The dividends expected on the shares
- f) The risk-free interest rate for the life of the option

For the company's share option plan, management's judgment is that the Black-Scholes valuation model is most appropriate for determining fair values as this model allows accounting for non-transferability and early exercise. Since the company became listed in March 2017, there is published share price information available to determine the fair value of its shares and the expected volatility of that value. These assumptions and estimates are further discussed in note 12 to the IFRS consolidated financial statements. The result of the share option valuations and the related compensation expense is dependent on the model and input parameters used.

For the equity-settled Avantium ESOP, the fair value of the grant is determined at the grant date. For the LTIP, the fair value is determined by the share price of the award at the grant date.

The fair value of the employee services received in exchange for the grant of the awards is recognised as an expense. For share-based payments that do not vest until the employees have completed a specified period of service, the group recognises the cost of services received as the employees render service during that period.



At each balance sheet date, the company revises its estimates of the number of awards that are expected to become exercisable. It recognises the impact of the revision of original estimates, if any, in the statement of comprehensive income and a corresponding adjustment to equity.

The proceeds received from exercised options net of any directly attributable transaction costs are credited to share capital (nominal value) and share premium.

Profit-sharing and Bonus Plans

The group recognises a liability and an expense for bonuses and profit-sharing where contractually obliged or where there is a past practice that has created a constructive obligation.

Termination Benefits

Termination benefits are payable when employment is terminated by the group before the normal retirement date, or when an employee accepts voluntary redundancy in exchange for these benefits. The group recognises termination benefits at the earlier of the following dates: (a) when the group can no longer withdraw the offer of those benefits; and (b) when the entity recognises costs for a restructuring that is within the scope of IAS 37 and involves the payment of terminations benefits. In the case of an offer made to encourage voluntary redundancy, the termination benefits are measured based on the number of employees expected to accept the offer. Benefits falling due more than 12 months after the end of the reporting period are discounted to present value.

2.19 Provisions

Provisions are recognised when the group has a present legal or constructive obligation as a result of past events; it is probable that an outflow of resources will be required to settle the obligation; and the amount can be reliably estimated.

The group provides for the estimated cost of product warranties at the time revenue is recognised and the group has a constructive obligation. Warranty provision is established based on the group's best estimates of the amounts necessary to settle future and existing claims on products sold as of the balance sheet date.

Provisions are measured at the present value of the expenditures expected to be required to settle the obligation using a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the obligation.

2.20 Revenue Recognition

Revenue comprises the fair value of the consideration received or receivable for the sale of goods and services in the ordinary course of the group's activities. Revenue is shown net of value-added tax, returns, rebates and discounts and after eliminating sales within the group.

The group recognises revenue when specific criteria have been met for each of the group's activities as described below. The group bases its estimates on historical results, taking into consideration the type of customer, the type of transaction and the specifics of each arrangement.

Sales of Goods

For the supply of goods, revenue is recognised at a point in time, as soon as the control relating to the title of the goods have been transferred to the customer and the entity has a present right to payment. In practice, this is at the shipment date or after installation (if applicable). Contracts related to sale of goods are typically the following:

- System parts
- Consumables
- Material offtake agreements originating from Avantium Renewable Polymers and Avantium Renewable Chemistries

A receivable is recognised when the goods are shipped as this is the point in time that the consideration is unconditional because only the passage of time is required before the payment is due.

Construction Contracts

Revenue and expenses related to Flowrence systems are accounted over time, which recognises revenue as performance of the contract progresses. The company satisfies the criteria prescribed under IFRS 15 for recognising revenue over time, since each sales contract agreed with a customer relates to the creation of a Flowrence system, a tailor-made machine, with varying components for the various chemistries which cannot be used for alternative purposes by the company and the company has an enforceable right to payment for the performance completed to date. The customer has full control over the Flowrence as it is being created. The customer can direct the specifics of how the asset is to be used and has input on the varying components of the Flowrence being created. The stage of completion is measured by referring to the contract costs incurred up to the end of the reporting period as a percentage of total estimated costs for each contract. Costs incurred in the year in connection with future activity on a contract are excluded from contract costs in determining the stage of completion.

On the balance sheet, the group reports the net contract position for each contract as either a contract asset or a contract liability. A contract represents a contract asset where costs incurred



plus recognised profits (less recognised losses) exceed progress billings; a contract represents a contract liability where the opposite is the case.

Variations in contract work, claims and incentive payments are included in contract revenue to the extent that may have been agreed with the customer and can be reliably measured.

Where the income of a revenue contract cannot be estimated reliably, contract revenue that is likely to be recovered is recognised to the extent of contract costs incurred. Contract costs are recognised as expenses in the period in which they are incurred.

Multiple Element Arrangements

In certain circumstances, it is necessary to apply the recognition criteria to the separately identifiable components of a single transaction in order to reflect the substance of the transaction. Conversely, the recognition criteria are applied to two or more transactions together when they are linked in such a way that the commercial effect cannot be understood without reference to the series of transactions as a whole.

The group offers arrangements whereby a customer purchases systems and installations services under one arrangement. When such multiple element arrangements exist, an element is accounted for as a separable element if it has value to the customer on a standalone basis and the fair value can be determined objectively and reliably. The transaction price is allocated to each separate element based on the stand-alone selling prices.

When Catalysis systems revenues and installation service revenues are identified as separable elements in a multiple element transaction, the systems revenue recognised is determined based on the standalone selling price of the systems in relation to the transaction price of the arrangement taken as a whole and is recognised as discussed above. The revenue relating to the installation service element, which represents the standalone selling price of the installation services in relation to the transaction price of the arrangement, is recognised on completion of the installation services.

This separation is justified due to the fact that the supply and installation of the goods are offered to the customer separately as the installation can also be executed by an independent third party.

Timing of payment by the customer from the supply of goods is based on the contractual identified instalments. This could result, on a product by product basis, in advanced payments. These amounts are reported as contract liabilities on the balance sheet under other current liabilities.

Sales of Services

Revenue from the sales of services is recognised over time recognising revenue based on the actual services provided to the end of the accounting period as a proportion of the total services to be performed.

Timing of payment by the customer from sale of services is based on the contractual identified technical milestones. This could result, on a project by project basis, in contract assets or contract liabilities. These amounts are reported on the balance sheet under other receivables or other current liabilities.

As part of the Renewable Chemistries business development agreements, which constitute solely a step-in, management identified this as one-off revenue recognition at moment of signing the agreements, in accordance with IFRS 15, since it is deemed that once the agreement is signed, no future obligation is to be fulfilled.

If circumstances arise that may change the original estimates of revenues, costs or extent of progress toward completion, estimates are revised. These revisions may result in increases or decreases in estimated revenues or costs and are reflected in income in the period in which the circumstances that give rise to the revision become known by management.

2.21 Grants

Grants and subsidies from third parties are recognised at their fair value when there is a reasonable assurance that the grant will be received, and the group will comply with all attached conditions. Any outstanding receivables related to these grants are recorded as other receivables under current receivables.

Government grants pre-financed amounts received are deferred and recognised in the income statement over the period necessary to match them with the costs that they are intended to compensate.

Government grants relating to property, plant and equipment are included in non-current liabilities as deferred government grants and are credited to the income statement on a straight-line basis over the expected lives of the related assets.

2.22 Interest Income

Interest income is recognised using the effective interest method. When a loan and receivable is impaired, the group reduces the carrying amount to its recoverable amount, being the estimated future cash flow discounted at the original effective interest rate of the instrument and continues unwinding the discount as interest income. Interest income on impaired loan and receivables is recognised using the original effective interest rate.

2.23 Leases

The group leases various offices and a number of vehicles. Rental contracts are generally made for fixed periods of 3 to 10 years but may have extension options. Lease terms are negotiated on an individual basis and contain a wide range of different terms and conditions. The lease agreements do not impose any covenants, but leased assets may not be used as security for borrowing purposes.

Contracts may contain both lease and non-lease components. The group allocates the consideration in the contract to the lease and non-lease components based on their relative stand-alone prices.

Leases are recognised as right-of-use asset and a corresponding liability at the date at which the leased asset is available for use by the group. Each lease payment is allocated between the lease liability and finance cost. The finance cost is charged to the statement of comprehensive income over the lease period so as to produce a constant periodic rate of interest on the remaining balance of the liability for each period. Right-of-use asset are depreciated on a straight-line basis over the remaining term of the lease or over the remaining economic life of the asset, if this is judged to be shorter than the lease term.

Assets and liabilities arising from a lease are initially measured on a present value basis.

Lease terms are negotiated on an individual basis and contain a wide range of different terms and conditions. The lease agreements do not impose any covenants other than the security deposits in the leased assets that are held by the lessor. Leased assets may not be used as security for borrowing purposes.

Lease Liability

Lease liabilities include the net present value of the following lease payments:

- fixed payments (including in-substance fixed payments), less any lease incentives receivable;
- variable lease payments are based on an index or a rate - decommissioning costs; and
- payments of penalties for terminating the lease, if the lease term reflects the lessee exercising that option.

The lease payments are discounted using the interest rate implicit in the lease. If that rate cannot be determined, the lessee's incremental borrowing rate is used, being the rate that the lessee would have to pay to borrow the funds necessary to obtain an asset of similar value in a similar economic environment with similar terms and conditions.

The group is exposed to potential future increases in variable lease payments based on an index or rate, which are not included in the lease liability until they take effect. When adjustments to lease payments based on an index or rate take effect, the lease liability is reassessed and adjusted against the right-of-use asset.

Right-of-Use Assets

Right-of-use assets are measured at cost comprising the following:

- the amount of the initial measurement of the lease liability;
- any lease payments made at or before the commencement date less any lease incentives received - any initial direct costs; and
- onerous contract provisions .

Right-of-use assets are generally depreciated over the shorter of the asset's useful life and the lease term on a straight-line basis. If the group is reasonably certain to exercise a purchase option, the right-of-use asset is depreciated over the underlying asset's useful life.

Payments associated with short-term leases and leases of low-value assets are recognised on a straight-line basis as an expense in profit or loss. Short-term leases are leases with a lease term of 12 months or less. Low-value assets comprise IT-equipment and small items of office furniture.

The group has no financial lease obligations.



2.24 Earnings per Share

Basic Earnings per Share

Basic earnings per share is calculated by dividing:

- The profit attributable to owners of the company, excluding any costs of servicing equity other than ordinary shares
- By the weighted average number of ordinary shares outstanding during the financial year, excluding treasury shares (note 13).

Diluted Earnings per Share

Diluted earnings per share adjusts the figures used in the determination of basic earnings per share to take into account:

- The after-income tax effect of interest and other financing costs associated with dilutive potential ordinary shares
- The weighted average number of additional ordinary shares that would have been outstanding assuming the conversion of all dilutive potential ordinary shares

2.25 Cash Flow Statement

The cash flow statement is presented using the indirect method. Cash flow in foreign currencies are converted at the exchange rate on the date of the cash flow, or based on the average rate. A distinction is made in the cash flow statement between the cash flows from operating, investment and financing activities.

3. Financial Risk Management

3.1 Financial Risk Factors

The group's activities expose it to a variety of financial risks: market risk (including currency risk, interest rate risk, cash flow interest rate risk and price risk), credit risk and liquidity risk. The group's risk management programme focuses on the unpredictable nature of financial markets and seeks to limit any potential adverse effects on financial performance.

Risk management is carried out by the central Finance & Accounting department (Group F&A) under policies approved by the Management Board. Group F&A identifies, evaluates and covers financial risks in close cooperation with the group's operating units. The board provides principles for overall risk management, as well as written policies covering specific areas such as foreign-exchange risk, interest rate risk, credit risk, use of non-derivative financial instruments, and investment of excess liquidity.

Financial instrument by category

Current Financial assets as at December 31:

<i>in Euro x 1,000</i>	Notes	2021	2020
Trade receivables	9	1,015	1,049
Other receivables	9	6,024	6,434
Cash and cash equivalents	10	34,911	26,626

Current Financial liabilities as at December 31:

<i>in Euro x 1,000</i>	Notes	2021	2020
Trade payables	14	4,714	1,910
Other liabilities	14	7,123	6,114
Deferred government grant	14	4,913	5,870
Lease liabilities	7	1,604	1,703

The carrying amounts of these financial assets and liabilities are assumed to approximate their fair values due to their short-term nature. Also refer to note 14 for an overview of trade and other payables.

Interest Rate Risk

As at 31 December 2021 there were no current or non-current borrowings. As the company has no significant interest bearing assets and liabilities, the direct impact of changes to the group's income and operating cash flow is limited.

Currency Risk

The group operates internationally and is exposed to foreign exchange risk primarily in relation to the US dollar. Foreign exchange risk arises from future commercial transactions, recognised assets and liabilities. Management has set up a policy that requires group companies to manage their foreign exchange risk against their functional currency. The group companies are required to close commercial transactions in euros. Certain US-based customers negotiate US-dollar contracts. There are a limited number of these contracts, and the group companies can only close these with management's written approval. The group's operations are therefore not subject to significant foreign exchange rate risks. Foreign exchange risk arises when future commercial transactions or recognised assets and liabilities are denominated in a currency that is not the entity's functional currency.

The group had outstanding trade receivables in US dollars of \$nil (2020: \$24,000). The group had no trade receivables in another foreign currency. The group had outstanding trade payables in US dollars of \$1,545,000 (2020: \$44,000), in British pound of £13,000 (2020: £29,000) and in Japanese Yen of ¥8,404,000 (2020: ¥1,128,000).

If at 31 December 2021, the euro had weakened by 10% against the US dollar with all other variables held constant, post-tax result for the year would have been €132,000 higher (2020: €1,500 higher). The US dollar cash position as at 31 December 2021 is \$26,069 (2020: \$16,833). The group had no cash position in other foreign currencies.

Credit Risk

Credit risk is managed on group basis. The group does not have any significant concentrations of credit risk and is limited to outstanding trade receivables, cash and cash equivalents. On 31 December 2021, the largest single client exposure consisted of 32% of the outstanding trade receivables. The group clients are subject to creditworthiness tests. Sales are subject to payment conditions varying between payments in advance and 30 days after invoice date. For certain projects, deviations to this rule may apply only after approval of group F&A, in which case additional security, including guarantees and documentary credits, may be required. Management

does not expect any losses from non-performance by its clients nor from concentration of this risk.

In 2021, €0 (2020: €0) of trade or other receivables was written off; €464,000 was past due, of which 39% had been paid before 1 March 2022.

The amount of trade and other receivables past due as at December 31, were as follows:

<i>in Euro x 1,000</i>	2021	2020
More than 1 month past due	181	207
More than 3 months past due	—	81
More than 6 months past due	283	150
	464	438

Impairment provisions for trade receivables are recognised based on the simplified approach within IFRS 9 to measuring expected credit losses which uses a lifetime expected loss allowance for all trade receivables and contract assets.

To measure the expected credit losses, trade receivables and contract assets have been grouped based on shared credit risk characteristics and the days past due. The contract assets relate to unbilled work in progress and have substantially the same risk characteristics as the trade receivables for the same types of contracts. The group has therefore concluded no provision for credit losses is required on trade receivables and contract assets, since after careful consideration of each customer's payment profile and likelihood to default on payments, the credit losses was deemed to be immaterial.

Trade receivables and contract assets are written off where there is no reasonable expectation of recovery. Indicators that there is no reasonable expectation of recovery include, amongst others, the failure of a customer to engage in a repayment plan with the group, and a failure to make contractual payment for a period of greater than 6 months past due. The group has therefore concluded that a provision of doubtful debt of €150,000 on the trade receivables had to be recognised as at 31 December 2021.

The maximum exposure to credit risk at the reporting date is the carrying value of each class of receivable mentioned above. The group does not hold any collateral as security. The long-term credit ratings of banks used by the group, as at 31 December 2021 at Moody's and S&P subsequently, are as follows. Group funds are held at Rabobank with a long-term credit rating of Aa2 and A+, ABN AMRO bank with a long-term credit rating of between A1 and A, and at ING Bank with a long-term credit rating between A- and A+.

Liquidity Risk

Prudent liquidity risk management implies maintaining sufficient cash and marketable securities, the availability of funding through an adequate amount of committed credit facilities and the ability to close out market positions.

The table below analyses the group's financial liabilities into relevant maturity groupings based on the remaining period at the balance sheet to the contractual maturity. The amounts disclosed in the table are the contractual discounted cash flows for continuing operations. The specific time buckets are not mandated by the standard but are based on a choice of management. The tables include both interest and principal cash flows:

As at December 31, 2021:

in Euro x 1,000	Less than 1 year	Between 1 and 2 years	Between 2 and 5 year	Over 5 years	Total
Lease liabilities	(1,604)	(1,497)	(5,408)	(2,194)	(10,703)
Trade payables	(4,714)	—	—	—	(4,714)
Deferred government grant	(4,913)	—	—	—	(4,913)
Other current liabilities	(7,123)	—	—	—	(7,123)
	(18,354)	(1,497)	(5,408)	(2,194)	(27,453)

As at December 31, 2020:

in Euro x 1,000	Less than 1 year	Between 1 and 2 years	Between 2 and 5 year	Over 5 years	Total
Lease liabilities	(1,703)	(1,330)	(4,078)	(2,595)	(9,706)
Trade payables	(1,910)	—	—	—	(1,910)
Deferred government grant	(5,870)	—	—	—	(5,870)
Other current liabilities	(6,114)	—	—	—	(6,114)
	(15,598)	(1,330)	(4,078)	(2,595)	(23,601)

The carrying amounts of these financial liabilities are assumed to approximate their fair values due to their short-term nature.

3.2 Capital Management

The group's objective when managing capital is to safeguard its ability to continue as a going concern (also refer to 2.1.1) in order to provide returns for shareholders and benefits for other stakeholders, and to maintain an optimal capital structure to reduce the cost of capital. To maintain or adjust the capital structure, the group monitors capital on the basis of its adjusted solvency ratio. This ratio is calculated as adjusted equity divided by the adjusted balance sheet total.

The adjusted equity is calculated as equity:

- Minus the intangible assets, participating interests and receivables from shareholders

The adjusted balance sheet total is calculated as total assets:

- Minus the intangible assets, participating interest, receivables from shareholders and shares held in the own company

The adjusted solvency ratios as at December 31, were as follows:

in Euro x 1,000	2021	2020
Equity attributable to owners of the parent	50,026	46,238
Intangible assets	(1,835)	(559)
Adjusted equity total	48,191	45,678
Adjusted balance sheet total	75,840	69,424
Adjusted solvency ratio	64%	66%



4. Critical Accounting Estimates and Judgments

The preparation of financial statements in accordance with IFRS requires the use of certain accounting estimates. It also requires management to exercise its judgement in the process of applying the group's accounting policies. Estimates and judgments are continually evaluated, and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances.

The resulting accounting estimates will, by definition, seldom equal the related actual results. The estimates and assumptions that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are addressed below.

Income Taxes

The group, which has a history of recent tax losses, recognises deferred tax assets arising from unused tax losses or tax credits only to the extent that the relevant fiscal unity has sufficient taxable temporary differences or there is convincing other evidence that sufficient taxable profit will be available against which the unused tax losses or unused tax credits can be utilised by the fiscal unity. Management's judgment is that there is not a high degree of certainty that sufficient profits will be earned to utilise the losses. Consequently, based on management's judgment, sufficient convincing other evidence is not available, and a deferred tax asset is therefore not recognised.

Share-based Payments

Share options granted to employees are measured at the fair value of the options granted (indirect method of measurement). For the company's share option plan, management's judgment is that the Black-Scholes valuation method is most appropriate for determining fair values. The assumptions and estimates used in the valuation are further discussed in note 12 to the consolidated financial statements.

The result of the share option valuations and the related compensation expense is dependent on the model and input parameters used. Even though management considers the fair values reasonable and defensible based on the methodologies applied and the information available, others might derive at a different fair value for the options granted under the company's share option plan.

Research and Development Expenditures

The project stage forms the basis in the decision of whether costs made for the group's product development programmes should be capitalised or not. Management judgment is required in determining when the group should start capitalising development costs as intangible assets.

Management determined that for a system, commercial feasibility is, in general, probable when the group has built a successful prototype and has interested customers for the commercial product. Management determined that for product development, (note 2.6) commercial feasibility is, in

general, probable when the group has successfully completed essential testing phases and are in a late stage of discussions with potential partners for commercialisation opportunities.

Revenue Recognition

The group recognises revenue over time or at point in time depending on the agreed contract performance obligations. For Flowrence® systems and services contracts the group recognises revenue over time as performance of the contract progresses. The performance on a contract relates to fixed-price contracts to construct tailor-made Flowrence® systems which the customers control and cannot be of alternative use to the company. For the Flowrence® systems, the stage of completion is measured by reference to the total contract costs incurred up to the end of the reporting period as a percentage of total estimated costs for each contract. Value is delivered to customers up to each of these points. For services, in order to recognise revenue over time, the group is required to estimate the series of distinct services performed to date as a proportion of the total services to be performed, where also stage gates are present, and value is added up to that point. To define the recognised revenues, the group estimates the required total costs (Flowrence®) or man-hours (services) to complete each project. On a regular basis a review of the total costs or man-hours is performed.

Going Concern

For the critical accounting judgment with regard to the going concern assumption, see note 2.1.1.

Government Grants

The group uses the percentage-of-completion (POC) method in accounting for its government grants it has been awarded. For grant programmes, use of the POC method requires the group to estimate the services/actions performed to date as a proportion of the total services or actions to be performed. For further considerations and assumptions with regard to the critical accounting estimate in relation to government grants, see note 2.21.

Impairment

Judgments and estimates are required, not only to determine whether there is an indication that an asset may be impaired, but also whether indications exist that impairment losses previously recognized may no longer exist or may have decreased (impairment reversal). After indications of impairment have been identified, judgments and estimates are also involved in the determination of the recoverable amount of a non-current asset. The recoverable amount is determined based on the higher of the fair value less cost to sell and the value-in-use. These involve estimates of expected future cash flows (based on future growth rates and remaining useful life) and residual value assumptions, as well as discount rates to calculate the present value of the future cash flows.

Notes to the Consolidated Statement of Financial Position

5. Property, Plant and Equipment

<i>in Euro x 1,000</i>	Leasehold improvements	Laboratory equipment	Hardware	Office furniture and equipment	Construction in progress ¹	Total
At At 1 January 2020						
Cost	24,953	33,224	2,901	2,121	2,763	65,962
Accumulated depreciation	(9,008)	(24,895)	(2,510)	(1,871)	—	(38,285)
Net book amount	15,944	8,329	391	250	2,763	27,677
Year ended 31 December 2020						
Opening net book amount	15,944	8,329	391	250	2,763	27,677
Additions	349	707	78	—	2,291	3,425
Disposals	—	(87)	—	—	(18)	(105)
Transfers	61	713	195	7	(976)	—
Accumulated depreciation on disposals	—	58	—	—	—	58
Impairment charge	—	(38)	—	—	—	(38)
Depreciation charge	(3,297)	(2,161)	(201)	(159)	—	(5,818)
Closing net book amount	13,058	7,521	463	97	4,060	25,198
At 31 December 2020						
Cost	25,364	34,519	3,174	2,127	4,060	69,244
Accumulated depreciation	(12,305)	(26,999)	(2,712)	(2,030)	—	(44,045)
Net book amount	13,058	7,521	463	97	4,060	25,198
Year ended 31 December 2021						
Opening net book amount	13,058	7,521	463	97	4,060	25,198
Additions	847	166	55	3	2,855	3,926
Disposals	—	(80)	—	—	—	(80)
Transfers	—	137	—	—	(137)	—
Accumulated depreciation on disposals	—	59	—	—	—	59
Impairment charge	—	—	—	—	—	—
Depreciation charge	(3,377)	(2,154)	(182)	(66)	—	(5,778)
Closing net book amount	10,528	5,649	336	34	6,777	23,324
At 31 December 2021						
Cost	26,209	34,743	3,229	2,131	6,777	73,089
Accumulated depreciation	(15,682)	(29,094)	(2,893)	(2,096)	—	(49,765)
Net book amount	10,528	5,649	336	34	6,777	23,324

The additions in property plant and equipment during 2021 predominantly relate to the investment in the (early) EPC work by Avantium Renewable Polymers segment, investment in product purification and handling in the pilot plant in Delfzijl for the Avantium Renewable Chemistries segment and upgrades to equipment for the Avantium Catalysis segment.

6. Intangible Assets

(In Euro x 1,000)	Development costs	Software	Intellectual Property	License rights	Other	Total
At 1 January 2020						
Cost	2,159	7,165	433	—	1,064	10,821
Accumulated amortization and impairment	(2,159)	(7,011)	—	—	(967)	(10,137)
Net book amount	—	155	433	—	97	684
Year ended 31 December 2020						
Opening net book amount	—	155	433	—	97	684
Additions	—	27	—	—	—	27
Amortization charge	—	(152)	—	—	—	(152)
Closing net book amount	—	30	433	—	97	559
At 31 December 2020						
Cost	2,159	7,193	433	—	1,064	10,848
Accumulated amortization and impairment	(2,159)	(7,163)	—	—	(967)	(10,289)
Net book amount	—	30	433	—	97	559
Year ended 31 December 2021						
Opening net book amount	—	30	433	—	97	559
Additions	—	6	—	1,326	—	1,331
Amortization charge	—	(36)	—	—	(20)	(56)
Closing net book amount	—	—	433	1,326	77	1,835
At 31 December 2021						
Cost	2,159	7,199	433	1,326	1,064	12,180
Accumulated amortization and impairment	(2,159)	(7,199)	—	—	(987)	(10,345)
Net book amount	—	—	433	1,326	77	1,835

The additions in intangible assets during 2021 predominantly relate to the patent license acquired from Eastman Chemical Company by Avantium Renewable Polymers. The settlement of this patent license acquired will be in three equal instalments. The first instalment will be settled in cash in January 2022. The other two instalments will be settled in cash or in shares in Avantium NV. Avantium may decide how it proposes to settle the two remaining instalments.

Development Costs

The development costs consist of the development and prototype expenses of the Flowrence system and are all fully amortised.

Software and Other Intangibles

Software mainly comprises purchased general laboratory and office-related software.

Other intangibles are the in-kind contribution of a shareholder relating to software at the foundation of the group and compensation paid to a third party to exclusively use parts of their technology.

Intellectual Property

Following the Liquid Light acquisition in 2016, the company records intellectual property (patent portfolio acquired) on its consolidated balance sheet, which will subsequently be lowered with accumulated amortisation the following years, when the technology on which the intellectual property is filed, is ready to deploy commercially. As at 31 December 2021, the recoverable amount of the intellectual property exceeds the carrying amount.

Total of research expenditures recognised as an expense in the consolidated statement of comprehensive income amounted to €1,011,000 (2020: €1,008,000) and mainly constitute of early stage research trials.

License Rights

The license rights consists of the licenses acquired for technologies not owned or developed by the company.

Included in the license rights is the Eastman license acquired by Avantium Renewable Polymers during 2021. As part of the license agreement, royalty fees will be payable to Eastman. The fees will equal to \$20 USD per metric ton of Licensed Products produced from the FDCA Flagship Plant. The commencement of the operations will be in 2024. The foregoing running royalty will be payable by Avantium in shares of Avantium N.V. (in equivalent value) on a semi-annual basis for the first two years of operation of the FDCA Flagship Plant, after which all such payments will be paid in cash. Avantium may decide how it proposes to settle the royalty fees for the first two years.

7. Leases

This note provides information for leases where the group is a lessee.

Amounts Recognised in the Balance Sheet

The balance sheet shows the following amounts relating to leases:

<i>in Euro x 1,000</i>	31-12-2021	31-12-2020
Properties	9,372	8,877
Motor vehicles	107	165
Total right-of-use assets	9,479	9,042

<i>in Euro x 1,000</i>	31-12-2021	31-12-2020
Current lease liabilities	1,604	1,703
Non-current lease liabilities	9,099	8,003
Total Lease liabilities	10,703	9,706

Additions to the right-of-use assets during the 2021 financial year were nil (2020: nil). The increase in the right-of-use assets are due to modifications in the lease agreements. The lease modifications are due to lease terms being modified and lease assumptions changing.

Amounts Recognised in the Statement of Comprehensive Income

The statement of comprehensive income shows the following amounts relating to leases:

<i>in Euro x 1,000</i>	2021	2020
Properties	1,842	1,490
Motor vehicles	161	99
Total depreciation charge of right-of-use assets	2,003	1,589

<i>in Euro x 1,000</i>	2021	2020
Interest expense included in finance cost	230	217
Total interest charge on lease liabilities	230	217

The cash flow net of VAT related to principal elements of the lease payments amounted to €1,663,000 (2020: €1,608,000).

Some of the lease agreements contain variable lease elements that are linked to the usage of the lease, which is not included in the measurement of the lease liability. The variable lease payments for the year not included in the measurement of the lease liability amounted to €349,000 (2020: €342,000).

The short term and low value lease expenses for 2021 amounted to €54,000 (2020: €43,000).

In 2020 management reassessed the onerous lease contract which was recognised in prior years. Since management's intention for the use of the lease asset changed, they concluded that the requirements of an onerous contract was no longer met. The onerous contract was therefore reversed on 31 December 2020.

8. Inventories

<i>(In Euro x 1,000)</i>	31-12-2021	31-12-2020
Raw materials	883	875
Work in progress	355	350
	1,238	1,225

The costs of inventories recognised as an expense and included in raw materials and contract costs, amounted to €260,000 (2020: €269,000).

9. Trade and Other Receivables

(In Euro x 1,000)	31-12-2021	31-12-2020
Trade receivables	1,015	1,049
Less: Allowance for doubtful debt	(150)	(150)
Social security and other taxes	881	606
Prepayments	367	317
Contract assets	3,514	3,059
Other receivables	1,262	2,452
Current portion	6,888	7,333

The other receivables comprise primarily of funding to be received in relation to government grants where the company has already complied with the attached conditions under the specific grant program (€888,000) and deposits held at third parties (€252,000).

In 2021, €0 (2020: €0) of trade receivables was written off and €464,000 (30 days or more after invoice date) was past due, of which 39% was paid before 1 March 2022 and of the remaining 61%, 53% is for a customer for which a provision for doubtful debt was recognised.

Trade receivables and contract assets are written off where there is no reasonable expectation of recovery. The company assessed the trade receivables balance as at 31 December 2021 and concluded that the provision for doubtful debt of €150,000 recognised during 2020 still represents the expectation of recovery (see also note 3.1). The carrying amounts of these financial assets are assumed to approximate their fair values.

Impairment provisions for trade receivables are recognised based on the simplified approach within IFRS 9 to measuring expected credit losses which uses a lifetime expected loss allowance for all trade receivables and contract assets.

To measure the expected credit losses, trade receivables and contract assets have been grouped based on shared credit risk characteristics and the days past due. The contract assets relate to unbilled work in progress and have substantially the same risk characteristics as the trade receivables for the same types of contracts. The group has therefore concluded no provision for credit losses is required on trade receivables and contract assets, since after careful consideration of each customer's payment profile and likelihood to default on payments, the credit losses was deemed to be immaterial.

10. Cash and Cash Equivalents

(In Euro x 1,000)	31-12-2021	31-12-2020
Cash at bank and on hand	33,411	25,126
Restricted cash	1,500	1,500
Cash and cash equivalents for cash flow purposes	34,911	26,626

The carrying amounts of these financial assets are assumed to approximate their fair values. A notional cash pool agreement is in place for all Rabobank accounts where balances are netted on a daily basis. Within the cash pool, there are €0 overdrafts.

The cash and cash equivalents presented in the consolidated statement of financial position and the consolidated statement of cash flow include restricted cash of €1.5 million, deposit held with Rabobank, which represent an amount equal to the current outstanding bank guarantees issued to third parties. For further information on commitments issued to third parties, refer to note 26.

11. Share Capital and Other Reserves

Avantium N.V. listed on Euronext Amsterdam and Euronext Brussels.

11.1 Ordinary Shares

The authorised share capital amounted to €4,500,000 consisting of 45,000,000 ordinary shares, with a nominal value of €0.10 each. The issued share capital at 31 December 2021 comprises 31,286,447 ordinary shares (2020: 25,912,170). In 2021, 167,688 options were exercised by employees, from these option exercises, 167,688 resulted in additional ordinary shares issued. At 31 December 2021, zero (2020: zero) shares were held by the Stichting Administratiekantoor Avantium (the Foundation) and nil employee shares were repurchased. All 31,286,447 shares issued are fully paid and stated at its par value of €0.10 each.

11.2 Other Reserves

The costs of equity settled share-based payments to employees are recognised in the statement of comprehensive income, together with a corresponding increase in equity during the vesting period, taking into account (deferral of) corporate income taxes. The accumulated expense of the share incentive plan recognised in the statement of comprehensive income is shown as part of the equity category 'other reserves' in the consolidated statement of changes in equity.

Additionally, included in the "other reserve" category is the share-based payment for the Eastman license acquired in 2021. The settlement of the share-based payment will be in two equal instalments. The first instalment will be made at the starting date of construction of the FDCA flagship plant or 8 months after the Final Investment Decision, whichever is sooner. The second instalment will be made at the completion date of construction of the FDCA flagship plant or 24 months after the Final Investment decision, whichever is sooner. Avantium has the option to settle the outstanding amounts in shares or cash.

11.3 Currency Translation Difference

The group does not hold a company reporting in any other currency than euros and therefore does not hold a currency translation reserve.

11.4 Treasury Shares

The total value of treasury shares outstanding at 31 December 2021 is €616,000 (2020: €616,000).

12. Share-based Payment

The group operates share-based compensation plans for its employees, which consists of an Employee Share Option Plan (ESOP) and a Long-term Incentive Plan (LTIP). These plans are classified as equity-settled share-based payment plans.

Long-term Investment Plan (LTIP)

The members of the management team are obligated to invest a percentage of their (net) bonus in (depository receipts for) shares to be delivered by the company under the LTIP. Each Investment share relates to one share. The cash component of the bonus may, at the discretion of the relevant member of the management team, also be invested in Investment shares. The Investment shares are subject to a retention period of five years, during which the investment shares cannot be sold. After the end of the retention period, the company will match the (depository receipts for) shares granted under the LTIP at a 1:1 ratio, i.e. one Matching share is granted for each Investment share.

The entitlement to receive Matching shares will be reduced as follows in the case of termination: 100% if the termination date is prior to the first anniversary of the date of Award; 66.67% if the termination date is prior to the second anniversary but after the first anniversary of the date of Award; 33.33% if the termination date is prior to the third anniversary but after the second anniversary of the date of Award.

In 2021, no additional awards were granted under the Long term Investment Plan (LTIP).

The movements in outstanding LTIP awards with the Management Board and senior management can be summarised as follows:

Long-term Investment Plan	2021		2020	
	Number of awards	Weighted Average share price at grant date (in Euro)	Number of awards	Weighted Average share price at grant date (in Euro)
Number of awards outstanding 1 January	179,494	4.45	87,254	5.36
Number of matching shares forfeited	(3,739)	2.93	—	—
Number of awards granted (including matching shares)	—	—	92,240	3.59
Number of awards outstanding 31 December	175,755	4.49	179,494	4.45

LTIP awards outstanding at the end of the year had the following share price at grant date:

Grant date	Share price at grant date in Euro	Number of awards
1 July 2017	10.50	5,418
16 March 2018	5.36	65,155
21 March 2019	2.64	16,681
14 May 2020	3.59	88,501
At 31 December 2021		175,755

The fair value of LTIP awards under the Long-term Investment Plan is determined by the share price at grant date and the weighted average fair value of LTIP awards granted during 2020 was €3.59 per award.

Employee Share Option Plan (ESOP)

On an annual basis and on certain other occasions set out in the plan rules, options under the Employee Share Option Plan (ESOP) may be conditionally granted to eligible employees of the company. The options will vest yearly over a three-year vesting period. The vested options have an exercise period of five years after vesting, after which the option expires.

In 2021, 417,500 share options were granted. In 2021, 167,688 options were exercised with a weighted-average share price of €6.13 at the date of exercise by the employees.

Further details on the grants in 2021 can be found in the table below.

Grant date	Plan	Number of ESOP options granted	Exercise price in Euro per option
19 May 2021	ESOP	417,500	4.56

The movements in outstanding options with the Management Board, senior management and certain other employees can be summarised as follows:

Share Option	2021		2020	
	Number of options	Weighted Average exercise price (in Euro)	Number of options	Weighted Average exercise price (in Euro)
Number of options outstanding 1 January	2,500,324	2.44	2,149,587	2.46
Number of options exercised	(167,688)	6.13	(136,640)	5.71
Number of options forfeited	(32,151)	4.25	(104,583)	5.85
Number of options granted	417,500	4.56	591,960	3.73
Number of options outstanding 31 December	2,717,985	2.52	2,500,324	2.44

Share options outstanding at December 31, 2021, amounted to 2,717,985. The exercise prices range from €0.10 to €10.58. The weighted average remaining contractual term for options outstanding at December 31, 2021, was 4.5 years.

Avantium N.V. has issued shares resulting from the exercise of options to the Stichting Administratiekantoor Avantium (the Foundation).

The Foundation has issued depository receipts to members of the Management Board, senior management and certain other employees. The Foundation is a consolidated special purpose entity set up by Avantium N.V. The shares held by the Foundation, however, only represent the voting rights associated with the issued shares and depository receipts representing all economic benefits

issued by the Foundation to members of the Management Board, senior management and certain other employees, and consequently the shares held by the Foundation are not considered treasury shares.

The number of options which are exercisable at the end of the period (i.e. vested, but not yet exercised) amounted to 1,220,963.

The fair value of options under the equity-settled share-based payment plans is determined using the Black-Scholes valuation model and the weighted average fair value of options granted during 2021 was €1.98 per option (2020: €1.56).

The significant inputs into this model were as follows:

	19 May 2021
Exercise price	€4.56
Volatility	42%
Risk free interest rate	-0.23%
Dividend yield	—
Expected life	7.6 years
Early exercise rate	5%

The historical volatility used is based on the volatility of the company's own shares in combination with the historical volatility of a peer group (five companies in total which are considered to be comparable listed companies), of which the daily stock returns over a period equal to the maturities of each plan related to the valuation dates was used.

During the year, a reclassification was made from other reserves to retained earnings, totalling €182,856, to reflect the effect of exercised and expired options in 2021.

13. Earnings per Share

Earnings per Share

Earnings per share for the years 2021 and 2020 are derived below:

In Euro	31-12-2021	31-12-2020
Loss from continuing operations	(24,416,470)	(22,829,594)
Loss for the period - basic	(24,416,470)	(22,829,594)
Dilutive adjustments	—	—
Loss for the period - diluted	(24,416,470)	(22,829,594)
Weighted average number of ordinary shares	29,756,527	25,886,849
Number		
Options per end of the year	2,717,985	2,500,324
LTIP awards per end of the year	175,755	179,494
Effect of dilutive / anti-dilutive securities	2,893,740	2,679,818
Weighted average number of shares - diluted	29,756,527	25,886,849
In Euro		
Earnings per share - basic	(0.82)	(0.88)
Earnings per share - diluted	(0.82)	(0.88)

Basic earnings per share are calculated by dividing the net result for the period by the weighted average number of ordinary shares. Diluted earnings per share are calculated by dividing the net results for the period on a diluted basis by the weighted average number of shares on a diluted basis. As the company is in a loss-making position, the options and LTIP awards have an antidilutive impact on the diluted earnings per share, for this reason the options and LTIP awards for the year are not considered in the calculation of diluted earnings per share.

14. Trade and Other payables

(In Euro x 1,000)	31-12-2021	31-12-2020
Trade payables	4,714	1,910
Social security and other taxes	360	428
Holiday pay and holiday days	1,338	1,292
Contract liabilities	1,328	1,580
Deferred government grants	4,913	5,870
Other current liabilities	4,096	2,814
	16,750	13,894

The other current liabilities comprise primarily of other staff pay related accruals (€1,967,000) and accrued expenses (€2,129,000). Deferred government grants comprise of advances received in relation to government grants. The carrying amounts of these financial liabilities are assumed to approximate their fair values.

Contract liabilities relating to systems contracts are balances due to customers under construction contracts. These arise if a particular milestone payment exceeds the revenue recognised to date under the percentage-of-completion method. Contract liabilities relating to services are balances due to customers under services contracts. These arise if particular services are to be rendered over time for which a prepayment has been received.

The following table shows how much of the revenue recognised in the current reporting period relates to carried-forward contract liabilities:

In Euro x 1,000)	31-12-2021	31-12-2020
Revenue recognized that was included in the contract liability balance at the beginning of the period		
<ul style="list-style-type: none"> ■ Systems contracts ■ Services contracts ■ Renewable chemistries 	110	197
	385	161
	—	—
	495	358



15. Borrowings

The group had no borrowings in 2021 and 2020.

Bank Overdrafts

As at 31 December 2021, the group had no overdraft facilities with any bank.

16. Provisions for Other Liabilities and Charges

(In Euro x 1,000)	Warranty provision
Balance at 1 January 2020	137
Additional provision	38
Unused amounts reversed	(27)
Settlement of provision	—
Used during the year	(4)
At Balance at 31 December 2020	145
Balance at 1 January 2021	145
Additional provision	78
Unused amounts reversed	(21)
Used during the year	(5)
Balance at 31 December 2021	196

Warranty

The provision for warranty consists of estimated costs for repairs of installed products during the warranty period of one year. This estimate is based on historical experience of broken or repaired units and the costs associated with that. This provision is current (shorter than one year). Unused amounts are reversed after expiration of the warranty period.

Notes to the Consolidated Statement of Comprehensive Income

17. Revenues

Reported consolidated revenue from continuing operations increased by 11% from €9.9 million in 2020 to €10.9 million in 2021. All revenue is recognised over time, except for revenues from renewable chemistry development agreements, systems revenue generated out of spare parts sold and Material offtake agreements (MTA) from Renewable Polymers (see note 2.20). Revenues per segment are reported under note 19. All revenue reported originates in the Netherlands.

The following table depicts the disaggregation of revenue from contracts with customers:

2021 (in Euro x 1,000)	Catalysis services revenue	Catalysis systems revenue	Renewable Chemistry development agreements	Renewable Polymers MTA agreements	Total
Segment revenue	3,227	6,802	500	388	10,917
Revenue from external customers	3,227	6,802	500	388	10,917
Timing of revenue recognition					
▪ At a point in time	—	599	500	388	1,487
▪ Over time	3,227	6,203	—	—	9,430
Total	3,227	6,802	500	388	10,917

2020 (in Euro x 1,000)	Catalysis services revenue	Catalysis systems revenue	Renewable Chemistry development agreements	Renewable Polymers MTA agreements	Total
Segment revenue	3,323	5,851	405	285	9,863
Revenue from external customers	3,323	5,851	405	285	9,863
Timing of revenue recognition					
▪ At a point in time	—	622	405	285	1,312
▪ Over time	3,323	5,229	—	—	8,552
Total	3,323	5,851	405	285	9,863

As of 31 December 2021, the aggregate amount of the transaction price in Catalysis allocated to the remaining performance obligations is €6.1 million (2020: €7.8 million) and the group will recognise this revenue as the progress on each contract is completed, which is estimated to occur over the next 9–24 months.

18. Other Income

(In Euro x 1,000)	2021	2020
Grants recognised	6,686	8,403
	6,686	8,403

The group recognised total government grants of €6,686,000 (2020: €8,403,000) to contribute to Avantium's development programmes, where efforts are focused on developing a new catalytic process for making bio-based ethylene-glycol and on developing an economical viable chemical process to convert ligno-cellulosic biomass into high quality glucose as feedstock for bio-based chemical, and in Renewable Polymers, for its plant-to-plastics YXY Technology®.

19. Segment Information

Description of the Segments and Principal Activities

In the company, the management team consists of the Chief Executive Officer, Chief Financial Officer, Chief Technology Officer, Group Legal Counsel, and the Managing Directors of Avantium Renewable Chemistries, Avantium Catalysis, and Avantium Renewable Polymers. It has identified three separate business segments:

- Avantium Catalysis provides advanced catalysis R&D services, systems and testing to industry-leading global customers. Catalysts help to limit the environmental impact of the petrochemical industry by making processes more efficient, reducing unwanted side products, and removing impurities and pollutants. With the scalable catalyst testing system, Flowrence®, Avantium Catalysis helps customers reach their sustainability, profit and growth targets.
- Avantium Renewable Chemistries develops PlantMEG. PlantMEG is a plant-based and cost-competitive alternative for fossil-based MEG – an important chemical building block for PET and PEF resin, both of which are used in bottles and packaging; fibres for clothing, furniture and the automotive industry; and solvents and coolants. The common basis, on which each activity rests, is formed by Avantium's unique technological capabilities that have been validated through the execution of millions of experiments, covering a broad range of chemistries, including highly complex and challenging R&D projects. The portfolio of programmes includes the Volta programme, and the Dawn Technology and Ray Technology™.
- Avantium Renewable Polymers aims to commercialise our YXY plants-to-plastics Technology®. This technology catalytically converts plant-based sugars into FDCA (furanicarboxylic acid) and materials such as the new plant-based packaging material PEF (polyethylene furanoate). PEF is a 100% plant-based, 100% recyclable plastic with superior performance properties compared to today's widely used petroleum-based packaging materials.

All employees of Avantium are employed in the Netherlands. The average number of full time equivalent employees of the group per business segment and other departments is as follows:

<i>(in full time equivalent employees)</i>	2021	2020
Catalysis	48	47
Renewable Chemistries	69	71
Renewable Polymers	55	54
Unallocated	40	40
Total average number of FTE during the year	213	211

EBITDA

The main KPI of the company within the profit & loss account is EBITDA. Note that the EBITDA figure excludes company overheads and shared service activities.

The EBITDA is calculated in the following manner: Profit/loss for the period plus Finance costs-net plus depreciation, amortisation and impairment charge.

The EBITDA figures of the business segments are as follows.

<i>(In Euro x 1,000)</i>	2021	2020
Catalysis	2,705	2,582
Renewable Chemistries	(2,320)	(1,605)
Renewable Polymers	(7,094)	(7,331)
Total EBITDA of business segments	(6,708)	(6,353)

Revenues per Segment

<i>(In Euro x 1,000)</i>	2021	2020
Catalysis	10,029	9,173
Renewable Chemistries	500	405
Renewable Polymers	388	285
Total segment revenue	10,917	9,863

Revenue is only generated from external customers and no transactions with other segments have taken place.

Other Income per Segment

<i>(In Euro x 1,000)</i>	2021	2020
Catalysis	279	235
Renewable Chemistries	3,610	5,764
Renewable Polymers	2,683	2,288
Unallocated items	114	116
Total segment other income	6,686	8,403

Reconciliation

(In Euro x 1,000)	2021	2020
Total EBITDA of business segments	(6,708)	(6,353)
Amortisation	(56)	(152)
Depreciation of property, plant and equipment	(5,778)	(5,856)
Depreciation of right of use assets	(2,003)	(1,589)
Finance costs - net	(495)	(325)
Share based compensation	(828)	(895)
Rent	(241)	(179)
Reversal / (Expense) due for onerous contract	—	492
Company overheads/other	(8,307)	(7,971)
Loss before income tax from continuing operations	(24,416)	(22,830)

The 'Other' costs category comprises mainly of company overhead costs.

Depreciation and Amortisation

(In Euro x 1,000)	2021	2020
Catalysis	(396)	(513)
Renewable Chemistries	(3,547)	(3,474)
Renewable Polymers	(1,932)	(1,932)
Unallocated items	(1,962)	(1,677)
Total Depreciation and amortisation	(7,837)	(7,597)

20. Expenses by Nature

Net operating expenses in 2021 amounted to €33.7 million (2020: €33.2 million). The net operating expenses of 2020 included a one-off reversal of the onerous lease provision of €0.5 million. Which explains the increase in costs during 2021 compared to prior year.

Depreciation, amortisation and impairment charges increased to €7,837,000 (2020: €7,597,000). The increase is mainly a result of the remeasurement of the right of use assets during 2021 due lease modifications that took place during the year, resulting in an increase in the depreciation of right of use assets.

Raw materials and contract costs in 2021 amounted to €3,042,000 (2020: €2,339,000) and comprises of cost of goods sold, costs of laboratory consumables directly attributable to revenue projects, and other specific costs related to revenues. The increase is mainly as a result of the higher revenues recorded for the year.

Patent, license, legal and advisory costs in 2021 amounted to €4,312,000 (2020: €4,204,000). The increase is mainly due to external advisors hired by Avantium Renewable Polymers in preparation for the Final Investment Decision.

Other operating expenses in 2021 amounted to €1,568,000 (2020: €1,528,000) and comprises of external development costs, such as trials, and other general costs including company insurances. The increase is mainly related to the company insurances which have been indexed based on the triennial taxation performed. The company insurances as of 2021 reflected the latest asset values after the completion of assets of the Delfzijl pilot plant in the Renewable Chemistries segment.

Advertising and representation expenses in 2021 amounted to €707,000 (2020: €679,000) and comprises of external and internal marketing, communications, and business development efforts, including travel. Wages for internal business development staff is excluded, as this is included under employee benefit expenses. The increase is mainly due to the relaxation of measures in relation to COVID-19 travel restrictions, as travel to certain countries was possible again in 2021.

Employee benefit expenses in 2021 amounted to €19,226,000 (2020: €19,262,000) and includes wages and salaries, social security costs, share options granted to directors and employees, pension costs, and government grants received. The decrease is mainly as a result of the release of the 2020 bonus accrual of €905,000, since the bonus over 2020 was not paid out to employees. This decrease was partially offset by an increase of the average number of FTE's during the year and the wage increase.



Office and housing expenses in 2021 amounted to €1,968,000 (2020: €1,990,000) and comprises of short-term rental agreements, other facility related costs, telephony and other IT related office materials and costs. Laboratory expenses in 2021 amounted to €2,864,000 (2020: €3,664,000) and comprises of laboratory consumables, spare parts, maintenance and repair work in the laboratory, and small laboratory projects. The decrease in laboratory expenses is mainly a result of the delayed start up of the pilot plant in Delfzijl after the accident that took place in the first quarter of 2021.

21. Employee Benefits

(In Euro x 1,000)	2021	2020
Wages and salaries	18,776	18,282
Government grants R&D (WBSO)	(3,316)	(3,032)
Social security costs	1,990	2,203
ESOP expense (note 12)	828	702
LTIP awards expense (note 12)	—	193
Pension costs - defined contribution plans	948	913
	19,226	19,262
Number of full time equivalent employees at the end of the year	213	218

The average number of FTEs during 2021 was 213 (2020: 211).

In 2021, €3,316,000 (2020: €3,032,000) government grants in the form of WBSO were recognised directly as an offset of employee benefit expenses.

22. Finance Income and Costs

(In Euro x 1,000)	2021	2020
Finance costs:		
Net foreign exchange (gains) loss	2	1
Interest current accounts	120	69
Financing component of lease payments	230	217
Other finance costs	144	76
Finance costs	497	362
Finance income:		
Interest current accounts	(2)	(37)
Finance income	(2)	(37)
Finance costs - net	495	325

23. Income Tax Expense

The company forms an income tax group with its subsidiaries. Under the standard conditions, the members of the tax group are jointly and severally liable for any taxes payable by the group. At the end of 2021, Avantium Renewable Polymers B.V. and Furanix Technologies B.V. left the Avantium N.V. fiscal unity in preparation for the moment when minority shareholders will join (expected to be by April 2022).

As a consequence of Avantium Renewable Polymers B.V. and Furanix Technologies B.V. leaving the Avantium N.V. fiscal unity, a taxable revaluation of certain assets took place within the Avantium N.V. fiscal unity. The consolidated taxable profit of the Avantium N.V. fiscal unity in 2021 (including the taxable revaluation) amounts to approximately €32 million (2020: Tax loss of €26 million). This tax profit will be fully compensated by existing carry forward tax losses of the Avantium N.V. fiscal unity. As a consequence no tax charge was identified for 2021 (2020: nil).

In line with last year, the company did not recognise any deferred tax asset in relation to the losses carried forward as it is not considered probable that there will be sufficient taxable profit against which the unused tax losses can be utilised.



Total remaining amount of tax losses carry forward for the fiscal unity as of 31 December, 2021 is approximately €146 million. This was €178.3 million in 2020. The Avantium N.V. fiscal unity intends to transfer approximately €41 million of its carry forward tax losses as of 31 December 2021 to Avantium Renewable Polymers B.V. and Furanix Technologies B.V. who left the Avantium N.V. fiscal unity. After such transfer of tax losses, the remaining amount of tax losses carried forward for the Avantium N.V. fiscal unity will amount to approximately €106 million.

These losses will be subject to the new tax loss utilisation rules that apply as of 1 January 2022. As part of the new rules, an indefinite carry forward loss set-off will apply as of 1 January 2022 (the current carry-forward period is six years, the carry-back period is and will remain one year). However, tax losses will only be fully available for carry-forward and carry-back set off up to an amount of €1 million of taxable profit per year. In the case of a profit which is higher than €1 million, the amount above €1 million can only be set off up to 50% of that higher taxable profit.

The company does not use contrived or abnormal tax structures that are intended for tax avoidance.

(In Euro x 1,000)	2021	2020
Loss before tax	(24,416)	(22,830)
Tax at applicable tax rate in the Netherlands of 25% (2020: 25%)	6,104	5,708
Non-deductable expenses	590	793
Subtotal	6,694	6,501
Derecognition of deferred tax assets	—	(6,501)
Tax profit as a result from revaluation of certain assets	(13,970)	—
Utilisation of previously unrecognised deferred tax assets	7,276	—
Tax charge	—	—

The nominal tax rates and amount in 2021 are 15% up to €245,000 and 25% over €245,000.

24. Dividends

The company declared no dividends for any of the years presented in these consolidated financial statements.

Other Notes to the Consolidated Financial Statements

25. Contingencies

During 2021, the company had no contingencies to report.

26. Commitments & Guarantees

Guarantees

In 2020, the company renegotiated a new €3.0 million cash-collateralised guarantee facility, which replaced the initial €2.0 million guarantee facility the company had in the prior years.

This guarantee facility is also disclosed as part of the cash equivalents in note 10, which represents an amount equal to the current guarantees issued to third parties totalling €999,000. These guarantees are primarily issued in relation to payments from customers following a systems deal for which a bank guarantee had to be issued.

27. Related-party Transactions

Identification of Related Parties

Key management is defined as those persons having legal authority and responsibility for planning, directing and controlling the activities of the entity, directly or indirectly, including any director (whether executive or otherwise) of that entity. Our key management comprises the members of the Management Board and the Supervisory Board.

Key Management Changes 2021

In August 2021, the Supervisory Board proposed the appointment of Mr. Nils Björkman as sixth member of the Supervisory Board. At the Extraordinary General Meeting (EGM) held on 25 January 2022, Nils Björkman was appointed as Supervisory Board member for a term of four year.

The following persons were members of the Supervisory Board on 31 December 2021:

- Edwin Moses, Chairperson
- Margret Kleinsman, Vice Chairperson
- Trudy Schoolenberg
- Cynthia Arnold
- Michelle Jou

Key Management Remuneration Policy

Avantium does not grant its key management with any personal loans, guarantees or advance payments. For further information on the remuneration policy refer to the [Remuneration Report](#).

Key Management Remuneration 2021

The total remuneration paid to members of the Management Board and independent members of the Supervisory Board amounted to €1,023,000 (2020: €737,000) and €403,000 (2020: €321,000) respectively.

The following table provides a breakdown of the remuneration in 2021 of the members of the Management Board:

(In Euro x 1,000) Management Board	Salary	Other benefits ²⁶	Cash bonus	Investment share bonus	Share-based payments	Post-employee benefits	Severance payments	Total Remuneration
T.B. van Aken								
2021	268	25	78	78	114	20	—	584
2020	268	26	—	—	117	19	—	430
B.J.J.V. Welten								
2021	235	27	49	49	52	27	—	439
2020	228	26	—	—	29	25	—	307
Total - 2021	503	52	128	128	167	46	—	1,023
Total - 2020	495	52	—	—	145	44	—	737

The following table provides a breakdown of the remuneration in 2021 of the members of the Supervisory Board:

(In Euro x 1,000)	Annual fee ²⁷		Share-based payments		Travel expenses		Total	
Supervisory Board member	2021	2020	2021	2020	2021	2020	2021	2020
E. Moses	79	90	51	48	—	—	130	138
M.G. Kleinsman	50	50	—	—	—	—	50	50
G.E. Schoolenberg	44	13	—	—	—	—	44	13
M.B.B. Jou	55	32	18	17	—	1	73	50
CA. Arnold	48	13	40	12	5	1	93	26
Nils Bjorkman	13	—	—	—	—	—	13	—
Total Supervisory Board members	289	198	109	77	5	2	403	277
Former Supervisory Board members								
D.J. Lucquin	—	37	—	—	—	7	—	44
Total former Supervisory Board members	—	37	—	—	—	7	—	44

²⁶ Other benefits mainly include contributions to social security plans, benefits in kind such as company cars, medical expenses and legal expenses.



28. Proposed Appropriation of Result

In anticipation of the Annual General Meeting's adoption of the annual accounts, the net loss for the year of €24,416,470 has been added to accumulated losses.

29. Events After the Balance Sheet Date

On 25 January 2022 at the Extraordinary General Meeting of Shareholders, Avantium's shareholders approved the issuance of 2.84 million warrants, with an exercise price of € 0.10, to a consortium of banks as part of a € 90 million debt as part of a financing package of the flagship. In the same meeting the Management Board was authorised to issue €45 million in ordinary shares. The purpose of the funding is to allow the company to develop its portfolio of technologies beyond FDCA and for general corporate purposes. Refer to note 2.1.1 Going Concern for further details on the approval of the warrant options and issue of ordinary shares.

Avantium closely monitors the geopolitical concerns around the Russian invasion in Ukraine and the substantial impact on the global economy and financial markets, as well as the severe impact on energy and commodity prices (including wheat), adding to inflationary pressures from supply chain disruptions. Avantium's commercial exposure to Russia is limited to €0.3 million collection risk in Catalysis related to a system that is already delivered. The situation remains highly fluid and the outlook is subject to extraordinary uncertainty, and therefore the ultimate impact on Avantium's business going forward is still impossible to accurately predict.

²⁷ The membership fee included within the annual fee excludes the fee covering the onboarding period prior to the respective appointments, being equal to the prorated base membership fee (€40,000 on pro rate basis).



Company Financial Statements 2021

Company Balance Sheet

As at December 31

The balance sheet has been prepared before appropriation of current year result.

(In Euro x 1,000)	Note	2021	2020 Restated ²⁸
ASSETS			
Non-current assets			
Financial fixed assets	33	3,902	31,585
Receivables from group companies	34	72,473	44,300
Right-of-use assets		7,210	6,988
Total non-current assets		83,585	82,873
Current assets			
Other receivables		419	333
Cash and cash equivalents		28,506	22,608
Total current assets		28,925	22,941
Total assets		112,510	105,814
EQUITY			
Equity attributable to owners of the parent			
Ordinary shares	11	3,129	2,591
Share premium		230,252	204,296

(In Euro x 1,000)	Note	2021	2020 Restated ²⁸
Other reserves	11	11,936	10,407
Accumulated losses		(195,291)	(171,057)
Total equity		50,026	46,238
LIABILITIES			
Non-current liabilities			
Lease liabilities		8,028	7,412
Provisions	36	1,729	24
Payables to group companies	35	52,284	51,896
Total Non-current liabilities		62,040	59,332
Current liabilities			
Trade payables		229	244
Other current liabilities		215	—
Total current liabilities		444	244
Total liabilities		62,484	59,576
Total equity and liabilities		112,510	105,814

²⁸ See note 31 for details regarding the restatement as a result of a material reclassification misstatement.



Company Income Statement

For the financial year ended December 31

in Euro x 1,000	2021	2020
Other revenues	—	—
Operating expenses		
Employee benefit expenses	(848)	(722)
Office and housing expenses	13	(1)
Patent, license, legal and advisory expenses	(188)	(360)
Reversal due for onerous contract	—	492
Other operating expenses	(23)	(21)
Depreciation, amortisation and impairment charge	(1,313)	(986)
Operating loss	(2,359)	(1,598)
Finance costs - net	(382)	(232)
Result before income tax	(2,741)	(1,830)
Income tax expense	—	—
Result subsidiaries and joint ventures	(21,676)	(21,000)
Loss for the period	(24,416)	(22,830)

Notes to the Company Financial Statements

30. General Information

The company statements are part of the 2021 financial statements of Avantium N.V.

The financial statements of the company are prepared in accordance with the provision of Part 9, Book 2 of the Dutch Civil Code. For setting the principles for the recognition and measurement of assets and liabilities and determination of the result of its company financial statements, Avantium N.V. makes use of the option provided in Section 2:362 (8) of the Dutch Civil Code. This means that the principles of the recognition and measurements of assets and liabilities and determination of the result (hereinafter referred to as accounting policies) of the company financial statements of Avantium N.V. are the same as those applied for the consolidated financial statements under IFRS (refer to note 2). By applying this option, reconciliation is maintained between the group's equity and the company's equity.

In the company financial statements, investments in group companies are stated as net asset value, in accordance with the equity method, if the company effectively exercises influence of significance over the operational and financial activities of these investments. The net asset value is determined on the basis of the accounting principles applied by the company. In case the net asset value of an investment in a group company is negative, any existing loans to group companies considered as net investment are impaired. A provision for any remaining equity deficit is recognised when an outflow of resources is probable and can be reliably estimated.

The consolidated financial statements have been prepared in accordance with International Financial Reporting Standards (IFRS) as adopted by the European Union. Please refer to the notes to the consolidated financial statements for a description of these principles.

31. Restatement as a result of a material reclassification misstatement

In the 2020 company only financial statements a provision was recorded for investments in group companies with negative net asset values. As per the accounting policy, any existing intercompany receivables which are an extension of the net investment should have been impaired. To the extent that the company has guaranteed all or part of the liabilities of the participating interest or has a constructive obligation to ensure that the participating interest will pay (its share) of its liabilities, a provision for any remaining equity deficit should have been recognised when an outflow of resources is probable and can be reliably estimated. In addition intercompany receivables and payables were presented on a net basis instead of on a gross basis. This has been adjusted in the 2020 comparative years disclosed in the company only financial statements. This restatement did not impact the company Income Statement nor Equity. The impact of the misstatement is disclosed in the table below.

(In Euro x 1,000)	As at 31 December 2020	Restatement	2020 Restated
ASSETS			
Non-current assets			
Financial fixed assets	60,921	(29,336)	31,585
Receivables from group companies	—	44,300	44,300
Total non-current assets	60,921	14,964	75,885

(In Euro x 1,000)	As at 31 December 2020	Restatement	2020 Restated
LIABILITIES			
Non-current liabilities			
Provisions	36,956	(36,932)	24
Payables to group entities	—	51,896	51,896
Total non-current liabilities	36,956	14,964	51,920

32. Equity Attributable to Equity Holders of the Company

For details of the movements in and components of equity, reference is made to the consolidated statement of changes in equity of the consolidated financial statements and the notes to these.

33. Financial Fixed Assets

The company directly held 100% interests in the following subsidiaries on 31 December 2021:

- Avantium Technologies B.V., Amsterdam
- Renewable Technologies B.V., Amsterdam
- Avantium Support B.V., Amsterdam
- Avantium Knowledge Centre B.V., Amsterdam
- Feedstock Technologies B.V., Amsterdam
- Avantium Renewable Polymers B.V., Amsterdam
- Synvina C.V., Amsterdam

The movements in financial fixed assets can be summarised as follows:

(In Euro x 1,000)	Financial fixed assets
On January 1, 2020	34,857
Share of loss in group companies	(3,272)
Other equity movements in subsidiaries	—
On December 31, 2020	31,585

(In Euro x 1,000)	Financial fixed assets
On January 1, 2021	31,585
Share of loss in group companies	(3,651)
Other equity movements in subsidiaries	(24,032)
On December 31, 2021	3,902

Refer to note 31 for the restatement as a result of a material reclassification misstatement.

34. Receivables from group companies

(In Euro x 1,000)	2021	2020
Group receivables outstanding 1 January	44,300	42,604
Movements in receivables from group companies	28,173	1,696
Group receivables outstanding 31 December	72,473	44,300

The fair value of the intercompany amounts in Avantium N.V. to group companies approximates their book values.

Refer to note 31 for the restatement as a result of a material reclassification misstatement.

During 2021, a number of intercompany balances have been contributed between the group entities as part of a tax structuring step plan that was executed. This tax structuring step plan was executed within the Avantium corporate tax fiscal unity and the purpose was to structure the Avantium Renewable Polymers group appropriately before minority shareholders step in to Avantium Renewable Polymers B.V. The intercompany balances were contributed through share premium transactions.

35. Payables to group companies

(In Euro x 1,000)	2021	2020
Group payables outstanding 1 January	(51,896)	(51,867)
Movements in payables to group companies	(387)	(29)
Group payables outstanding 31 December	(52,284)	(51,896)

The fair value of the intercompany amounts in Avantium N.V. to group companies approximates their book values.

Refer to note 31 for the restatement as a result of a material reclassification misstatement.

36. Provisions

a) Provisions for the year were as follows:

(In Euro x 1,000)	Provisions
On January 1, 2020	(23)
Share of loss in group companies	—
Movements in provisions	(1)
On December 31, 2020	(24)

(In Euro x 1,000)	Provisions
On January 1, 2021	(24)
Share of loss in group companies	—
Movements in provisions	(1,705)
On December 31, 2021	(1,729)

The provisions for financial fixed assets with a negative net equity as at 31 December 2021 relate to the following:

- Equity deficit of Feedstock Technologies B.V. of €24,000 (2020: €24,000)
- Equity deficit of Avantium Renewable Polymers B.V. of €1,704,000 (2020: €0)

Refer to note 31 for the restatement as a result of a material reclassification misstatement.

37. Commitment and Contingencies

The company is part of a fiscal unity for corporate income taxes. As a consequence, the company bears joint and several liability for the debts with respect to corporate income taxes. The company settles corporate income taxes, in principle, based on the results before taxes of the subsidiaries belonging to the fiscal unity.

Avantium has issued joint and several liability for the debts arising out of the legal acts of these subsidiaries, in accordance with Section 403 Part 9, Book 2 of the Dutch Civil Code. Each of these subsidiaries has filed Avantium's 403 declaration with the Dutch trade register:

- Avantium Support B.V.
- Avantium Technologies B.V.
- Avantium Chemicals B.V.

38. Audit Fees

The fees listed below relate to the procedures applied to the company and its consolidated group entities by PricewaterhouseCoopers Accountants N.V., the Netherlands, the independent external auditor as referred to in section 1(1) of the Dutch Accounting Firms Oversight Act (Dutch acronym: Wta), as well as by other Dutch and foreign-based PricewaterhouseCoopers Accountants N.V. individual partnerships and legal entities, including their tax services and advisory groups:

(In Euro x 1,000)	2021	2020
Audit of the financial statements	377	234
Other audit procedures	—	—
Tax services	—	—
Other non-audit services	1	—
Total	378	234

39. Remuneration of the Management Board and the Supervisory Board

The remuneration of the Supervisory Board amounted to €403,000 (2020: €321,000). The total remuneration paid to or for the benefit of members of the Management Board in 2021 amounted to €1,023,000 (2020: €737,000). For further details, refer to note 27 of the consolidated financial statements.

40. Employee Information

The company had no employees in 2021 (2020: nil).



Signing

Amsterdam, 22 March 2022

Avantium N.V. (Chamber of Commerce number: 34138918)

Management Board

Tom van Aken, Chief Executive Officer

Bart Welten, Chief Financial Officer

Supervisory Board

Edwin Moses, Chairperson

Margret Kleinsman

Trudy Schoolenberg

Cynthia Arnold

Michelle Jou

The financial statements are authorised for issue by the Management Board on 22 March 2022.

T.B. van Aken

B.J.J.V Welten

Chief Executive Officer

Chief Financial Officer



Other Information

Articles of Association Governing Profit Appropriation

According to article 31 of the company's Articles of Association, the Annual General Meeting determines the appropriation of the company's net result for the year.



Independent Auditor's Report

To: the General Meeting and Supervisory Board of Avantium N.V.

Report on the financial statements 2021

Our opinion

In our opinion:

- the consolidated financial statements of Avantium N.V. together with its subsidiaries ('the Group') give a true and fair view of the financial position of the Group as at 31 December 2021 and of its result and cash flows for the year then ended in accordance with International Financial Reporting Standards as adopted by the European Union ('EU-IFRS') and with Part 9 of Book 2 of the Dutch Civil Code;
- the company financial statements of Avantium N.V. ('the company') give a true and fair view of the financial position of the company as at 31 December 2021 and of its result for the year then ended in accordance with Part 9 of Book 2 of the Dutch Civil Code.

What we have audited

We have audited the accompanying financial statements 2021 of Avantium N.V., Amsterdam. The financial statements include the consolidated financial statements of the Group and the company financial statements.

The consolidated financial statements comprise:

- the consolidated statement of financial position as at 31 December 2021;
- the following statements for 2021: the consolidated statements of comprehensive income, changes in equity and cash flows; and
- the notes, comprising significant accounting policies and other explanatory information.

The company financial statements comprise:

- the company balance sheet as at 31 December 2021;
- the company income statement for the year then ended;
- the notes, comprising the accounting policies applied and other explanatory information.

The financial reporting framework applied in the preparation of the financial statements is EU-IFRS and the relevant provisions of Part 9 of Book 2 of the Dutch Civil Code for the consolidated financial statements and Part 9 of Book 2 of the Dutch Civil Code for the company financial statements.

The basis for our opinion

We conducted our audit in accordance with Dutch law, including the Dutch Standards on Auditing. We have further described our responsibilities under those standards in the section 'Our responsibilities for the audit of the financial statements' of our report.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Independence

We are independent of Avantium N.V. in accordance with the European Union Regulation on specific requirements regarding statutory audit of public-interest entities, the 'Wet toezicht accountantsorganisaties' (Wta, Audit firms supervision act), the 'Verordening inzake de onafhankelijkheid van accountants bij assuranceopdrachten' (ViO, Code of Ethics for Professional Accountants, a regulation with respect to independence) and other relevant independence regulations in the Netherlands. Furthermore, we have complied with the 'Verordening gedrags- en beroepsregels accountants' (VGBA, Dutch Code of Ethics).

Material uncertainty related to going concern

We draw attention to the going-concern paragraph in the note 2.1.1. Going Concern of the financial statements, which indicates that the company, given its nature of operations, needs to obtain funding to finance the ongoing operations and the further development of its technologies. With respect to the Avantium Renewable Polymers business, the company is finalising obtaining funding for the construction of the FDCA flagship plant. Subsequently, the company will need to obtain



general funding to finance the other ongoing operations in the course of 2022. This funding has not been secured yet. These conditions indicate the existence of a material uncertainty which may cast significant doubt about the company's ability to continue as a going concern. Our opinion is not modified in respect of this matter.

Our audit approach

We designed our audit procedures in the context of our audit of the financial statements as a whole. Our comments and observations regarding individual key audit matters, our audit approach regarding fraud risks and our audit approach regarding going concern should be read in this context and not as a separate opinion or conclusion on these matters.

Overview and context

Avantium N.V. is a chemical technology company, developing and commercialising innovative renewable chemistry solutions. As of 31 December 2021, the company consisted of three business units (Renewable Polymers, Renewable Chemistries and Catalysis), which were subject to our audit procedures as set out in the section 'The scope of our group audit'. We paid specific attention to the areas of focus driven by the operations of the Group, as set out below.

Reaching a positive Final Investment Decision (FID) by Avantium management on the construction of the FDCA Flagship Plant characterised the financial year 2021. Confirming the FID for the Flagship Plant involved meeting three key conditions: (i) securing sufficient financing, (ii) obtaining sufficient offtake commitments and (iii) finalising the engineering and establishing the supply chain. The FID is subject to financial close, which is planned by April 2022, with which Avantium Renewable Polymers business plan will be fully funded. The ringfenced financing for Avantium Renewable Polymers and obtaining general funding for the Group is fundamental to the Group's continuity as noted in section 2.1.1. Going Concern of the annual report.

The Management Board has made plans to successfully obtain financing at the level of the Group consisting of a combination of equity and government grants to provide for the company's operations. Because of the significance of the Management Board's assertion with respect to the probability of obtaining financing and the Management Board's assessment on the Group's ability to continue as a going concern, we have paid specific attention to this in our audit.

As part of designing our audit, we determined materiality and assessed the risks of material misstatement in the financial statements. In particular, we considered where the Management Board made important judgements, for example, in respect of significant accounting estimates that involved making assumptions and considering future events that are inherently uncertain. In note 4 Critical Accounting Estimates and Judgments of the financial statements, the company describes the areas of judgement in applying accounting policies and the key sources of estimation uncertainty. Given the significant estimation uncertainty and the related higher inherent risks of material misstatement in the impairment assessment of property, plant and equipment, we considered this matter as a key audit matter as set out in the section 'Key audit matters' of this report.

Other areas of focus, that were not considered as key audit matters, were project revenue recognition, accounting for government grants and accounting for share-based payments. As in all of our audits, we also addressed the risk of management override of controls, including evaluating whether there was evidence of bias by the Management Board that may represent a risk of material misstatement due to fraud.

We ensured that the audit team at group level included the appropriate skills and competences which are needed for the audit of a listed chemical technology company. We therefore included experts and specialists in the areas of business restructuring, IT audit, valuations and share-based payments in our team.

Avantium N.V. assessed the possible effects of climate change on their financial position, in the section The World Around Us of the Management Board Report, Avantium disclosed the climate-related risks. We discussed their assessment and governance thereof with management and evaluated the potential impact on the financial position including underlying assumptions and estimates. The impact of climate change is not considered a key audit matter.

The outline of our audit approach was as follows:



Materiality

- Overall materiality: €750,000.

Audit scope

- All group components were in scope, being Renewable Polymers, Renewable Chemistries and Catalysis business unit. We audited all group components as part of our audit.
- For all components, the group engagement team performed the work.

Key audit matters

- Material uncertainty related to going concern (included as a separate section in our report, as required by the Dutch Standard 570).
- Impairment assessment of property, plant and equipment.

Materiality

The scope of our audit was influenced by the application of materiality, which is further explained in the section 'Our responsibilities for the audit of the financial statements'.

Based on our professional judgement, we determined certain quantitative thresholds for materiality, including the overall materiality for the financial statements as a whole as set out in the table below. These, together with qualitative considerations, helped us to determine the nature, timing and extent of our audit procedures on the individual financial statement line items and disclosures and to evaluate the effect of identified misstatements, both individually and in aggregate, on the financial statements as a whole and on our opinion.

Overall group materiality	€750,000 (2020: €750,000).
Basis for determining materiality	We used our professional judgement to determine overall materiality. We used 4% of the result before income tax as a guideline for our judgement. As a result of this, we could increase our materiality in comparison to last year, but we considered it more appropriate to apply the same materiality level as last year.
Rationale for benchmark applied	We used the result before income tax as the primary benchmark, a generally accepted auditing practice, based on our analysis of the common information needs of the users of the financial statements. On this basis, we believe that the result before income tax is an important metric for the financial performance of the company.

We also take misstatements and/or possible misstatements into account that, in our judgement, are material for qualitative reasons.

We agreed with the Supervisory Board that we would report to them any misstatement identified during our audit above €37,500 (2020: €37,500) as well as misstatements below that amount that, in our view, warranted reporting for qualitative reasons.

The scope of our group audit

Avantium N.V. is the parent company of a group of entities. The financial information of this group is included in the consolidated financial statements of Avantium N.V.

The group engagement team performed the audit work on all components, the group consolidation and financial statement disclosures. By performing these procedures, we have been able to obtain sufficient and appropriate audit evidence on the Group's financial information, as a whole, to provide a basis for our opinion on the financial statements.



Audit approach fraud risks

We identified and assessed the risks of material misstatements of the financial statements due to fraud. During our audit we obtained an understanding of the company and its environment and the components of the system of internal control, including the risk assessment process and management’s process for responding to the risks of fraud and monitoring the system of internal control and how the Supervisory Board exercises oversight, as well as the outcomes.

We refer to section Risk and Opportunity Management of the annual report where the Management Board reflects on its response to fraud risk.

We evaluated the design and relevant aspects of the system of internal control and in particular the fraud risk assessment, as well as among others the Code of Good Business Conduct, whistle blower procedures and Confidant policies. We evaluated the design and the implementation and, where considered appropriate, tested the operating effectiveness, of internal controls designed to mitigate fraud risks.

As part of our process of identifying fraud risks, we evaluated fraud risk factors with respect to:

- fraudulent financial reporting by management override of controls;
- fraudulent financial reporting by fraud in revenue recognition.

We evaluated these factors considering significance, likelihood and pervasiveness of each factor and considered whether they indicate that a risk of material misstatement due to fraud is present. Based on our evaluation, we identified the following fraud risks and performed the following specific procedures:

Identified fraud risk

Our audit work and observations

Risk of management override of controls

In our audit we paid attention to the risk of management override of controls, including the risk of potential misstatements as a result of fraud in estimates. This included risks of potential misstatements due to fraud based on an analysis of potential interests of management.

In this context we paid specific attention to tendencies in judgements and conclusions with respect to estimates as there could be incentives for- and pressure on management to realize results as included in the budget.

We have, to the extent relevant to our audit, evaluated the design of the internal control environment that reduces the risk of breach of internal control.

Also, we paid specific attention to user access management in the IT system.

We selected journal entries based on risk criteria and conducted specific audit activities for these entries, as part of which we also paid attention to significant transactions outside the normal course of business.

We also performed specific audit procedures regarding important management’s estimates as it relates to impairment assessment of property, plant and equipment, project cost estimates as well as government grants and share-based payments related estimates. In our assessment, we paid specific attention to the inherent risk of bias of the management on estimates.

Our audit procedures did not lead to specific indications of fraud or suspicions of fraud with respect to management override of controls.

We incorporated elements of unpredictability in our audit. We also considered the outcome of our other audit procedures and evaluated whether any findings were indicative of fraud or noncompliance. We considered available information and made enquiries of relevant executives, finance department, directors and the Supervisory Board. This did not lead to indications for fraud potentially resulting in material misstatements.



Identified fraud risk

Our audit work and observations

Risk of fraud in revenue recognition

As part of our risk assessment and based on a presumption that there are risks of fraud in revenue recognition, we evaluated which types of revenue transactions or assertions give rise to the risk of fraud in revenue recognition.

Avantium Catalysis Services & Systems is the company's revenue-generating business. Avantium recognises revenue over time or at point in time depending on the agreed contract performance obligations. There might be an incentive for management to shift revenue between the periods in order to satisfy stakeholders and/or reach KPIs outlined in compensation plans.

We consider cut-off as an assertion relevant for the risk of fraud in revenue recognition for catalysis service projects and testing systems.

Where relevant to our audit, we assessed the design of the internal control measures related to revenue reporting and in the processes for generating and processing journal entries related to the revenue.

We have used a primarily substantive testing approach with respect to the cost to complete by performing procedures to compare actual hours with budgeted hours and to determine the progress of the contracts.

Our audit procedures did not lead to specific indications of fraud or suspicions of fraud with respect to revenue recognition.

Audit approach going concern

As disclosed in section 'Funding Avantium' in note 2.1.1 in the financial statements, management performed their assessment of the entity's ability to continue as a going concern for the foreseeable future and concluded that there is a material uncertainty which may cast significant doubt about the company's ability to continue as a going concern.

Due to its nature as a technology development company with significant R&D expenses and negative cash flows over the past years and in the near future, Avantium remains dependent on additional external funding and regularly needs new financing sources.

Management's most significant assumptions underlying their plans/actions to address these conditions that indicate the existence of a material uncertainty which may cast significant doubt about the company's ability to continue as a going concern (hereafter: going concern risks) are:

- realisation of a fully funded business plan for the construction of the FDCA flagship plant of Avantium Renewable Polymers, subject to Financial Close, which is planned by April 2022;
- successful raise of additional funding for the technologies of the company other than Avantium Renewable Polymers, and
- management's forecast of the monthly cash spent for the other technologies.

In order to evaluate the appropriateness of management's use of the going concern basis of accounting, including management's expectation that their plans sufficiently address the identified going concern risks and the adequacy of the related disclosures, we, with support of business restructuring specialists, amongst others performed the following procedures:

- Considered whether management's going concern assessment includes all relevant information of which we are aware as a result of our audit, inquire with management regarding management's most important assumptions underlying their going concern assessment;
- Analysed the financial position per balance sheet date compared to prior year as well as the liquidity scenarios and sensitivity analysis, including the assessment of the progress towards the financial close of the company and towards additional equity funding;
- Read minutes of the meetings of shareholders, those charged with governance and relevant committees, as well as agreements reached with the equity partners, banks and other investors for reference to the progress towards the financial close for the FDCA flagship plant of Avantium Renewable Polymers financing package and additional equity funding for the other technologies;
- Evaluated the latest available cash flow forecast and sensitivity analysis, corroborated these with management's budgets, performed look-back procedures, assessed if the cash flow forecast is in line with all relevant information of which we are aware as a result of our audit;
- Assessed the disclosure of the facts and circumstances around the financing of the FDCA flagship plant and the funding of the other ongoing operations in the financial statements;



- Evaluated whether the material uncertainty with respect to going concern triggers accounting entries such as impairment of assets;
- Inquired with management as to their knowledge of going concern risks beyond the period of management's assessment.

We evaluated whether the going concern risks including management's plans/actions to address the identified risks and the most significant underlying assumptions have been sufficiently described in note 2.1.1. Going Concern of the financial statements. We found the disclosure in note 2.1.1. Going Concern of the financial statements, where management disclosed conditions that indicate the existence of a material uncertainty which may cast significant doubt about the company's ability to continue as a going concern, to be adequate.

Key audit matters

Key audit matters are those matters that, in our professional judgement, were of most significance in the audit of the financial statements. We have communicated the key audit matters to the Supervisory Board. The key audit matters are not a comprehensive reflection of all matters identified by our audit and that we discussed. In this section, we described the key audit matters and included a summary of the audit procedures we performed on those matters.

We addressed the key audit matters in the context of our audit of the financial statements as a whole, and in forming our opinion thereon. We do not provide separate opinions on these matters or on specific elements of the financial statements. Any comment or observation we made on the results of our procedures should be read in this context.

In addition to the matter described in the section 'Material uncertainty related to going concern' we have determined the matter described below to be a key audit matter to be communicated in our report.



Key audit matter

Impairment assessment of property, plant and equipment (Refer to note 5 in the annual report)

As at 31 December 2021, the balance of property, plant and equipment of the company comprised €23.3 million. The valuation of this balance depends on the substantiation of the company's technologies potential.

As part of the annual closing process and triggered by an accident in the demonstration plant in Delfzijl as well as the material uncertainty related to going concern, the company performed an assessment of the recoverable amounts for the relevant assets. Considering a positive Final Investment Decision (FID) to construct the FDCA Flagship Plant, no impairment triggers were identified as it relates to Avantium Renewable Polymers. The Management Board concluded that the assets were not impaired as at 31 December 2021.

For purposes of performing the recoverability assessment, the Management Board identifies the relevant cash-generating units ('CGUs'). The recoverable amount of the underlying CGUs is determined as the higher of the fair value less cost of disposal or the value in use. The assessment contains a number of significant assumptions, both quantitative and qualitative, including revenue growth rate, cost structure, discount rate and timely completion of development projects. Changes in these assumptions may lead to potential impairment charges on the carrying value of the assets.

The use of assumptions in the assessment also requires estimates and judgment which may be affected by unexpected future market, economic or political conditions. With respect to Avantium Renewable Chemistries a fair value less cost of disposal model was applied and the Management Board concluded that no impairment was required.

We focused on this area as the Company's assets are significant to the company's operations and the assessment performed by the Management Board involved significant estimates and judgement.

Our audit work and observations

We obtained the Management Board's impairment assessment, which is based on the models calculating the recoverable amount using the fair value less cost of disposal method based on cash flow projections at the relevant CGU level.

Our audit of this matter focused on the Management Board's impairment assessment, which included the following procedures:

- Assessing the methodology used by the Management Board to estimate fair value less cost of disposal, assessing the accuracy and relevance of the input data to supporting evidence, such as approved budgets and considering the reasonableness of these budgets by comparing the budgets to the historical results.
- Assessing the appropriateness of the cash flows projection in calculation of the fair value less cost of disposal of these assets, challenging the reasonableness of key assumptions based on our knowledge of the business and industry, by comparing the assumptions to historical results and published market and industry data, and comparing the current year's actual results with the prior year forecast and other relevant information.
- Performing a sensitivity analysis in consideration of the potential impact of reasonably possible downside changes in these key assumptions.

We note that valuation of Avantium's property, plant and equipment is dependent on management ability to timely attract new funding.

Based on the audit procedures performed, we found that the conclusion made by the Management Board that no impairment was required was supported by reasonable assumptions, that were consistently applied and supported by available evidence.



Report on the other information included in the annual report

The annual report contains other information. This includes all information in the annual report in addition to the financial statements and our auditor's report thereon.

Based on the procedures performed as set out below, we conclude that the other information:

- is consistent with the financial statements and does not contain material misstatements;
- contains all the information regarding the directors' report and the other information that is required by Part 9 of Book 2 and regarding the remuneration report required by the sections 2:135b and 2:145 subsection 2 of the Dutch Civil Code.

We have read the other information. Based on our knowledge and the understanding obtained in our audit of the financial statements or otherwise, we have considered whether the other information contains material misstatements.

By performing our procedures, we comply with the requirements of Part 9 of Book 2 and section 2:135b subsection 7 of the Dutch Civil Code and the Dutch Standard 720. The scope of such procedures was substantially less than the scope of those procedures performed in our audit of the financial statements.

The Management Board is responsible for the preparation of the other information, including the directors' report and the other information in accordance with Part 9 of Book 2 of the Dutch Civil Code. The Management Board and the Supervisory Board are responsible for ensuring that the remuneration report is drawn up and published in accordance with sections 2:135b and 2:145 subsection 2 of the Dutch Civil Code.

Report on other legal and regulatory requirements and ESEF

Our appointment

We were appointed as auditors of Avantium N.V. by the Supervisory Board following the passing of a resolution by the shareholders at the annual general meeting held on 19 May 2021. Our appointment has been renewed annually by shareholders and now represents a total period of uninterrupted engagement of 18 years.

European Single Electronic Format (ESEF)

Avantium N.V. has prepared the annual report, including the financial statements, in ESEF. The requirements for this format are set out in the Commission Delegated Regulation (EU) 2019/815 with regard to regulatory technical standards on the specification of a single electronic reporting format (these requirements are hereinafter referred to as: the RTS on ESEF).

In our opinion, the annual report prepared in XHTML format, including the partially tagged consolidated financial statements as included in the reporting package by Avantium N.V., has been prepared in all material respects in accordance with the RTS on ESEF.

The Management Board is responsible for preparing the annual report, including the financial statements, in accordance with the RTS on ESEF, whereby the Management Board combines the various components into a single reporting package. Our responsibility is to obtain reasonable assurance for our opinion whether the annual report in this reporting package, is in accordance with the RTS on ESEF.

Our procedures, taking into account Alert 43 of the NBA (Royal Netherlands Institute of Chartered Accountants), included amongst others:

- Obtaining an understanding of the entity's financial reporting process, including the preparation of the reporting package.
- Obtaining the reporting package and performing validations to determine whether the reporting package, containing the Inline XBRL instance document and the XBRL extension taxonomy files, has been prepared, in all material respects, in accordance with the technical specifications as included in the RTS on ESEF.
- Examining the information related to the consolidated financial statements in the reporting package to determine whether all required taggings have been applied and whether these are in accordance with the RTS on ESEF.

No prohibited non-audit services

To the best of our knowledge and belief, we have not provided prohibited non-audit services as referred to in article 5(1) of the European Regulation on specific requirements regarding statutory audit of public-interest entities.

Services rendered

The services, in addition to the audit, that we have provided to the company or its controlled entities, for the period to which our statutory audit relates, are disclosed in note 35 to the financial statements.



Responsibilities for the financial statements and the audit

Responsibilities of the Management Board and the Supervisory Board for the financial statements

The Management Board is responsible for:

- the preparation and fair presentation of the financial statements in accordance with EU-IFRS and Part 9 of Book 2 of the Dutch Civil Code; and for
- such internal control as the Management Board determines is necessary to enable the preparation of the financial statements that are free from material misstatement, whether due to fraud or error.

As part of the preparation of the financial statements, the Management Board is responsible for assessing the company's ability to continue as a going-concern. Based on the financial reporting frameworks mentioned, the Management Board should prepare the financial statements using the going-concern basis of accounting unless the Management Board either intends to liquidate the company or to cease operations or has no realistic alternative but to do so. The Management Board should disclose in the financial statements any event and circumstances that may cast significant doubt on the company's ability to continue as a going concern.

The Supervisory Board is responsible for overseeing the company's financial reporting process.

Our responsibilities for the audit of the financial statements

Our responsibility is to plan and perform an audit engagement in a manner that allows us to obtain sufficient and appropriate audit evidence to provide a basis for our opinion. Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error and to issue an auditor's report that includes our opinion. Reasonable assurance is a high but not absolute level of assurance, which makes it possible that we may not detect all material misstatements. Misstatements may arise due to fraud or error. They are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements.

Materiality affects the nature, timing and extent of our audit procedures and the evaluation of the effect of identified misstatements on our opinion.

A more detailed description of our responsibilities is set out in the appendix to our report.

Rotterdam, 22 March 2022

PricewaterhouseCoopers Accountants N.V.

Original has been signed by A.F. Westerman RA



Appendix to our auditor's report on the financial statements 2021 of Avantium N.V.

In addition to what is included in our auditor's report, we have further set out in this appendix our responsibilities for the audit of the financial statements and explained what an audit involves.

The auditor's responsibilities for the audit of the financial statements

We have exercised professional judgement and have maintained professional scepticism throughout the audit in accordance with Dutch Standards on Auditing, ethical requirements and independence requirements. Our audit consisted, among other things of the following:

- Identifying and assessing the risks of material misstatement of the financial statements, whether due to fraud or error, designing and performing audit procedures responsive to those risks, and obtaining audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the intentional override of internal control.
- Obtaining an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the company's internal control.
- Evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Management Board.
- Concluding on the appropriateness of the Management Board's use of the going-concern basis of accounting, and based on the audit evidence obtained, concluding whether a material uncertainty exists related to events and/or conditions that may cast significant doubt on the company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report and are made in the context of our opinion on the financial statements as a whole. However, future events or conditions may cause the company to cease to continue as a going concern.
- Evaluating the overall presentation, structure and content of the financial statements, including the disclosures, and evaluating whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

Considering our ultimate responsibility for the opinion on the consolidated financial statements, we are responsible for the direction, supervision and performance of the group audit. In this context, we have determined the nature and extent of the audit procedures for components of the Group to ensure that we performed enough work to be able to give an opinion on the financial statements as a whole. Determining factors are the geographic structure of the Group, the significance and/or risk profile of group entities or activities, the accounting processes and controls, and the industry in which the Group operates. On this basis, we selected group entities for which an audit or review of financial information or specific balances was considered necessary.

We communicate with the Supervisory Board regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit. In this respect, we also issue an additional report to the Audit Committee in accordance with article 11 of the EU Regulation on specific requirements regarding statutory audit of public-interest entities. The information included in this additional report is consistent with our audit opinion in this auditor's report.

We provide the Supervisory Board with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related actions taken to eliminate threats or safeguards applied.

From the matters communicated with the Supervisory Board, we determine those matters that were of most significance in the audit of the financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, not communicating the matter is in the public interest.



Supplementary Information

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About This Report

ESEF Reporting Package

This is the PDF version of the Annual Report 2021 Avantium N.V. This version has been prepared for ease of use, and does not contain ESEF information as specified in the Regulatory Technical Standards on ESEF (Delegated Regulation (EU) 2019/815). The official ESEF reporting package is available on our website at www.avantium.com/at-a-glance/#key-financials.

Scope of the Annual Report

This Annual Report covers Avantium N.V., including all our consolidated entities as stated in 'Note 2.2.1 subsidiaries'. Our financial and non-financial results are presented in one report and relate to all consolidated entities for the period of January 1 until December 31, 2021, unless stated otherwise.

Reporting Guidelines

Integrated reporting and transparency have become increasingly important over the past few years. As such, Avantium prepared this Annual Report in line with the IIRC Integrated Reporting (IR) framework.

For the non-financial information included in this report, we followed the Global Reporting Initiative (GRI) Standards (GRI 1: Foundation 2021) and SASB (Sustainability Accounting Standards Board) Standards. A GRI and SASB content index, which has been included under supplementary information, shows where in the Annual Report information can be found.

Reporting Structure

This Annual Report outlines how Avantium creates value for our stakeholders in the long term. Our value creation model is presented at the beginning of the report, showing how our vision, mission and actions create a positive impact for our direct value chain and beyond. We present the cohesion of the different elements of our strategy, material topics, sustainability targets and the UN's Sustainable Development Goals, KPIs, and related risks.

Assurance

Currently, the financial data and related information is covered by external assurance. For non-financial information, we decided to not seek external assurance at this moment.

Safe Harbor Statement

This Annual Report may include forward-looking statements. Other than reported financial results and historical information, all statements featured in this Annual Report, including, without limitation, those regarding our financial position, business strategy and management plans and objectives for future operations, are forward-looking statements. These forward-looking statements are based on our current expectations and projections about future events and are subject to risks and uncertainties that could cause actual results to differ materially from those expressed in the forward-looking statements. Many of these risks and uncertainties relate to factors that are beyond

Avantium's ability to control or estimate precisely, such as future market conditions, the behaviour of other market participants and the actions of governmental regulators. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date of this Annual Report and are subject to change without notice. Other than as required by applicable law or the applicable rules of any exchange on which our securities may be traded, we have no intention or obligation to update forward-looking statements.

Our Contribution to the SDGs


SDG 3: Good Health and Well-Being


Our Contribution	<p>We embed our safety culture into everything we do, striving to be an accident- and incident-free workplace. We have robust safety procedures and systems in place, and obligatory safety training is provided to all new joiners. All Avantium employees are committed to our Golden Safety Rules.</p>
Material Topics	<ul style="list-style-type: none"> ■ Occupational Health & Safety ■ Health & Well-Being
Chain Reaction 2030 Targets	<p>Our Operations</p> <ul style="list-style-type: none"> ■ In 2023, all our plants will achieve ISO45001 certification.
	<p>Our People</p> <ul style="list-style-type: none"> ■ By 2030, we will be one of the 10 best companies to work for in the Netherlands.
Subtargets	<p>3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.</p>

SDG 4: Quality Education


Our Contribution	<p>Avantium has a well-established collaboration with the University of Amsterdam, accelerating product development using electrochemistry and linking the company to pioneering research. Several PhD students are working on their theses at Avantium, while contributing to the development of our technologies.</p> <p>Given the scale of the climate emergency and the need to shift away from fossil sources, Avantium wants to inspire the next generation of scientists to embrace sustainable chemistry. For long-term success, we need an inspired and diverse workforce, and we therefore engage with students at key moments throughout their education.</p>
Material Topics	<ul style="list-style-type: none"> ■ Next Generation of Scientists ■ Diversity & Inclusion
Chain Reaction 2030 Targets	<p>Our People</p> <ul style="list-style-type: none"> ■ By 2030, 100,000 students will have been engaged by Avantium on using chemistry for 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.
Subtargets	<p>4.4: By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.</p> <p>4.7: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.</p>




 SDG 5: Gender Equality	
Our Contribution	<p>We know that our differences unite us, and that diversity of thought has been shown to breed creativity and drive innovation. We have therefore 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.</p>
Material Topics	<ul style="list-style-type: none"> ■ Diversity & Inclusion ■ Talent Attraction & Retention
Chain Reaction 2030 Targets	<p>Our People</p> <ul style="list-style-type: none"> ■ By 2030, we will be one of the 10 best companies to work for in the Netherlands. ■ 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.
Subtargets	<p>5.5: Ensure women’s full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life.</p>


 SDG 7: Affordable and Clean Energy	
Our Contribution	<p>Our 2030 target states that Avantium will deliver net-zero carbon emissions from our own operations (scope 1 and 2) as well as conducting a baseline assessment of our scope 3 emissions and establishing a plan for reducing these emissions in line with climate science. To achieve this target, Avantium will switch to 100% renewable electricity.</p>
Material Topics	<ul style="list-style-type: none"> ■ Greenhouse Gas Emissions of Our Operations
Chain Reaction 2030 Targets	<p>Our Operations</p> <ul style="list-style-type: none"> ■ By 2030, Avantium will deliver net-zero carbon emissions from our own operations.
Subtargets	<p>7a: By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology.</p>




 SDG 8: Decent Work and Economic Growth	
Our Contribution	<p>We promote inclusive and sustainable economic growth by working towards our mission to transition the chemical industry to renewable feedstock and to secure a sustainable future for all.</p> <p>We strive to be a supportive employer where everyone feels they belong and have equal opportunities. We have an inclusive work environment and aim to ensure that our people have a good work-life balance. We also offer competitive primary and secondary benefits including healthcare, paid holiday time, meal plans and transportation programmes.</p>
Material Topics	<ul style="list-style-type: none"> Talent Attraction & Retention Next Generation of Scientists Diversity & Inclusion
Chain Reaction 2030 Targets	<p>Our People</p> <ul style="list-style-type: none"> By 2030, we will be one of the 10 best companies to work for in the Netherlands. By 2030, 100,000 students will have been engaged by Avantium on using chemistry for 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.
Subtargets	<p>8.2: Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors.</p> <p>8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.</p>


 SDG 9: Industry, Innovation and Infrastructure	
Our Contribution	<p>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 and fibres for textiles, furniture and vehicles. Our strategy is to develop licensing models for our renewable and sustainable technologies, scaling up production and enabling economies of scale. This will allow Avantium to generate a more circular impact.</p> <p>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 the fossil-based incumbent.</p>
Material Topics	<ul style="list-style-type: none"> Environmental Impact of Our Technologies Circularity Climate Advocacy
Chain Reaction 2030 Targets	<p>Our Technologies</p> <ul style="list-style-type: none"> By 2030, Avantium's technologies will deliver 1.5 million tonnes of CO₂m savings across the chemical industry. By 2030, Avantium will become a circular business. Our Leadership 100% of our advocacy will focus on transforming the chemical industry to become circular and fossil-free.
Subtargets	<p>9.4: By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.</p> <p>9.5: Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.</p>




 SDG 12: Responsible consumption and production	
Our Contribution	<p>The ground-breaking technologies Avantium develops are based on the use of renewable (plant-based or air-based) feedstocks. Plant-based feedstocks come from nature – these can be agricultural crops, residues 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.</p> <p>When developing new materials and technologies, we see it as our responsibility to avoid creating waste and pollution before we introduce new products to the market.</p>
Material Topics	<ul style="list-style-type: none"> Environmental Impact of Our Technologies Circularity Greenhouse Gas Emissions of Our Operations Hazardous Materials Non-Hazardous Materials Product Stewardship
Chain Reaction 2030 Targets	<p>Our Technologies</p> <ul style="list-style-type: none"> By 2030, Avantium's technologies will deliver 1.5 million tonnes of CO₂ savings across the chemical industry. By 2030, Avantium will become a circular business. By 2030, 100% of our renewable polymers and chemistries plant-based feedstock will come from sustainable sources. Our Operations By 2030, Avantium will deliver net-zero carbon emissions from our own operations. By 2025, Avantium will send zero non-hazardous waste to incineration and landfill.
Subtargets	<p>12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimise their adverse impacts on human health and the environment.</p> <p>12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and re-use.</p>

 SDG 13: Climate Action	
Our Contribution	<p>The global climate breakdown demands an entirely new way of doing business, moving the world away 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 and transition to circular chemicals and materials. We want to lead by example, and we demand more from ourselves to step up to address the climate crisis. The scale of the challenge demands that we actively engage in partnerships and collaborations with a broad range of stakeholders.</p>
Material Topics	<ul style="list-style-type: none"> Environmental Impact of Our Technologies Circularity Sustainable Feedstock Climate Advocacy Corporate Partnerships Climate-Related Regulation
Chain Reaction 2030 Targets	<p>Our Technologies</p> <ul style="list-style-type: none"> By 2030, Avantium's technologies will deliver 1.5 million tonnes of CO₂ savings across the chemical industry. By 2030, Avantium will become a circular business. By 2030, 100% of our renewable polymers and chemistries plant-based feedstock will come from sustainable sources. Our Leadership 100% of our advocacy will focus on transforming the chemical industry to become circular and fossil-free.
Subtargets	<p>13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.</p>



 SDG 15: Life on Land	
Our Contribution	<p>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 licence agreements of our renewable technologies. This will ensure that as our technologies are deployed, they will be a beacon not only for renewable chemistry but also for promoting sustainable sourcing of plant-based materials.</p>
Material Topics	<ul style="list-style-type: none"> ■ Sustainable Feedstock
Chain Reaction 2030 Targets	<p>Our Technologies</p> <ul style="list-style-type: none"> ■ By 2030, 100% of our renewable polymers and chemistries plant-based feedstock will come from sustainable sources.
Subtargets	<p>15.2: By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.</p>

 SDG 17: Partnerships for the Goals	
Our Contribution	<p>Our goal is to be a world leader in renewable and sustainable chemistry technology solutions, and to commercialise them through partnerships and licensing.</p> <p>We aim to license our sustainable technologies: aside from being the most capital-efficient way to commercialise our technologies, we believe it is also the fastest way to bring our sustainable solutions to market.</p> <p>The scale of the climate challenge demands that we actively engage in partnerships and collaborations with a broad range of stakeholders.</p>
Material Topics	<ul style="list-style-type: none"> ■ Climate Advocacy ■ Stakeholder Engagement ■ Corporate Partnerships ■ Climate-Related Regulation
Chain Reaction 2030 Targets	<p>Our Leadership</p> <ul style="list-style-type: none"> ■ 100% of our advocacy will focus on transforming the chemical industry to become circular and fossil-free.
Subtargets	<p>17.6: Enhance regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism.</p> <p>17.7: Promote the development, transfer, dissemination and diffusion of environmentally sound technologies.</p> <p>17.16: Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilise and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries.</p>



GRI and SASB Content Index

Statement of Use		
Avantium N.V. has reported the information cited in this GRI and SASB content index for the period 1 January 2021 to 31 December 2021 with reference to the GRI Standards and SASB Standards		
GRI 1 Used		
GRI 1: Foundation 2021		
Reporting Criteria (GRI and SASB)		
	Disclosure	Location in annual report
GRI 2: General Disclosures 2021	2-1 Organizational details	Financial Statements, Note 1 General Information (page 109)
	2-2 Entities included in the organization's sustainability reporting	Financial Statements, Note 2.2.1 Subsidiaries (page 111) The Value We Created in 2021 (page 27) About This Report (page 158)
	2-3 Reporting period, frequency and contact point	About This Report (page 158) Back cover
	2-5 External assurance	About This Report (page 158)
	2-6 Activities, value chain and other business relationships	Who We Are (page 9) Value Creation Model (page 17) The World Around Us (page 19) Our Strategy (page 24) Business Highlights 2021 (page 28)
	2-7 Employees	Our People - Diversity & Inclusion (page 43)
	2-9 Governance structure and composition	Report of the Supervisory Board (page 77)
	2-10 Nomination and selection of the highest governance body	Corporate Governance (page 100) Corporate Website
	2-11 Chair of the highest governance body	Message from the CEO (page 7) Management Board Biographies (page 73) Corporate Governance (page 100)
	2-12 Role of the highest governance body in overseeing the management of impacts	Corporate Governance (page 100)
	2-15 Conflicts of interest	Our Leadership and Governance - Responsible Business Principles (page 53)
	2-17 Collective knowledge of the highest governance body	Management Board Biographies (page 73)
	2-18 Evaluation of the performance of the highest governance body	Corporate Governance (page 100)



Avantium N.V. has reported the information cited in this GRI and SASB content index for the period 1 January 2021 to 31 December 2021 with reference to the GRI Standards and SASB Standards		
Statement of Use		
GRI 1 Used	GRI 1: Foundation 2021	
Reporting Criteria (GRI and SASB)	Disclosure	Location in annual report
	2-19 Remuneration policies	Remuneration Report 2021 (page 83)
	2-20 Process to determine remuneration	Remuneration Report 2021 (page 83) Corporate Governance (page 100)
	2-21 Annual total compensation ratio	Remuneration Report 2021 (page 83)
	2-22 Statement on sustainable development strategy	Message from the CEO (page 7) Our Strategy (page 24)
	2-23 Policy commitments	Our People (page 40) Our Leadership and Governance - Responsible Business Principles (page 53)
	2-24 Embedding policy commitments	Our People (page 40) Our Leadership and Governance - Responsible Business Principles (page 53)
	2-26 Mechanisms for seeking advice and raising concerns about ethics	Corporate Website
	2-27 Compliance with laws and regulations	Corporate Website
	2-28 Membership associations	Climate Advocacy (page 46) Stakeholder Engagement (page 47) Climate-Related Regulation (page 52)
	2-29 Approach to stakeholder engagement	Stakeholders and Materiality (page 21) Stakeholder Engagement (page 47)
GRI 3: Material Topics 2021	3-1 Process to determine material topics	Stakeholders and Materiality (page 21)
	3-2 List of material topics	Stakeholders and Materiality (page 21) About This Report (page 158)
	3-3 Management of material topics	The Value We Created in 2021 (page 27)
GRI 201: Economic Performance 2016	201-1 Direct economic value generated and distributed	Consolidated Financial Statements (page 105)
	201-2 Financial implications and other risks and opportunities due to climate change	World Around Us (page 19)
	201-3 Defined benefit plan obligations and other retirement plans	Employee Benefits note 2.18 and Share-Based Payment note 12 (page 128)
	201-4 Financial assistance received from government	Other Income note 18 (page 132)
GRI 205: Anti-corruption 2016	205-1 Operations assessed for risks related to corruption	Risks & Opportunities (page 60)
	205-3 Confirmed incidents of corruption and actions taken	Responsible Business Principles (page 53)



Avantium N.V. has reported the information cited in this GRI and SASB content index for the period 1 January 2021 to 31 December 2021 with reference to the GRI Standards and SASB Standards		
Statement of Use		
GRI 1 Used	GRI 1: Foundation 2021	
Reporting Criteria (GRI and SASB)	Disclosure	Location in annual report
GRI 206: Anti-competitive Behavior 2016	206-1 Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	Responsible Business Principles (page 53)
GRI 207: Tax 2019	207-1 Approach to tax	Current and Deferred tax note 2.17 (page 116); Income tax expense note 23 (page 119)
GRI 306: Waste 2020	306-1 Waste generation and significant waste-related impacts	Hazardous Materials Management (page 38)
	306-2 Management of significant waste-related impacts	Hazardous Materials Management; Non-Hazardous Waste Management (page 39)
	306-3 Waste generated	Hazardous Materials Management; Non-Hazardous Waste Management (page 39)
	306-4 Waste diverted from disposal	Hazardous Materials Management; Non-Hazardous Waste Management (page 39)
	306-5 Waste directed to disposal	Hazardous Materials Management; Non-Hazardous Waste Management (page 39)
GRI 403: Occupational Health and Safety 2018	403-1 Occupational health and safety management system	Occupational Health & Safety (page 35)
	403-2 Hazard identification, risk assessment, and incident investigation	Occupational Health & Safety (page 35)
	403-4 Worker participation, consultation, and communication on occupational health and safety	Occupational Health & Safety (page 35)
	403-5 Worker training on occupational health and safety	Occupational Health & Safety (page 35)
	403-6 Promotion of worker health	Health & Well-Being (page 41)
	403-8 Workers covered by an occupational health and safety management system	Occupational Health & Safety (page 35)
	403-9 Work-related injuries	Occupational Health & Safety (page 35)
SASB: Workforce Health & Safety RT-CH-320a.2	Description of efforts to assess, monitor, and reduce exposure of employees and contract workers to long-term (chronic) health risks	Occupational Health & Safety (page 35)
SASB: Safety & Environmental Stewardship of Chemicals RT-CH-410b.2	Discussion of strategy to (1) manage chemicals of concern and (2) develop alternatives with reduced human and/or environmental impact	Business Highlights 2021; Environmental Impact of Our Technologies; Product Stewardship (page 32)
SASB: Management of the Legal & Regulatory Environment RT-CH-530a.1	Discussion of corporate positions related to government regulations and/or policy proposals that address environmental and social factors affecting the industry	Supply Chain Responsibility (page 34); Gender and Background (page 44); Climate-Related Regulation (page 52)
GRI 405: Diversity and Equal Opportunity 2016	405-1 Diversity of governance bodies and employees	Diversity & Inclusion (page 43); Report of the Supervisory Board (page 77)
GRI 406: Non-discrimination 2016	406-1 Incidents of discrimination and corrective actions taken	Code of Conduct (page 53)
GRI 413: Local Communities 2016	413-1 Operations with local community engagement, impact assessments, and development programs	Next Generation of Scientists (page 45)



Statement of Use	Avantium N.V. has reported the information cited in this GRI and SASB content index for the period 1 January 2021 to 31 December 2021 with reference to the GRI Standards and SASB Standards	
GRI 1 Used	GRI 1: Foundation 2021	
Reporting Criteria (GRI and SASB)	Disclosure	Location in annual report
SASB: Community Relations RT-CH-210a.1	Discussion of engagement processes to manage risks and opportunities associated with community interests	Stakeholder Engagement (page 47)
GRI 416: Customer Health and Safety 2016	416-1 Assessment of the health and safety impacts of product and service categories	Product Stewardship (page 52)
GRI 418: Customer Privacy 2016	418-1 Substantiated complaints concerning breaches of customer privacy and losses of customer data	IP & Data Protection (page 50)



Glossary

This glossary has been carefully compiled and we believe it to be accurate. Definitions may however be based on Avantium's interpretation and such use of terms may differ from the meaning assigned to them elsewhere in the industry or otherwise.

Batchington

Avantium's proprietary Batchington platform accelerates customers' research and development through screening and optimisation experiments. It consists of two reactor blocks, each containing 12 small-scale pressure vessels, meaning that 12 experiments can be run in parallel. It offers a new way of carrying out high-pressure chemo-catalytic testing, and will bring benefits to our customers in fields like petrochemicals, fine chemicals and renewables.

Bio-Based Economy

A bio-based economy exists when predominantly plant-based materials (i.e. biomass rather than fossil-based raw materials like petroleum) are used as a feedstock for making the chemicals, materials and products we consume.

Bio-Based Plastic

These are plastics derived from man-made polymers that can be made from building blocks that originate from biological (once living) systems. Most of these building blocks (monomers) are derived from sugars. Examples are FDCA and PEF. At Avantium, we prefer to call PEF and FDCA plant-based plastics, in order to prevent confusion with the term bioplastic. Bioplastic is a plastic derived from a biopolymer, such as DNA, insulin, cellulose or starch.

Biodegradability/Biodegradation

Biodegradation is the breakdown of organic matter by microorganisms, such as bacteria and fungi, to produce CO₂ and water. PET is considered to break down in 300-500 years. The first results of tests by Organic Waste Systems Belgium show that PEF degrades much faster than PET under industrial composting conditions (full biodegradation in 250-400 days at 58° Celsius in soil). The degradability of PEF in the natural environment is under investigation via a 10-year field trial and we have observed that degradation starts within the first year. PEF degradation does not occur during normal use of PEF. Only when a PEF product unintentionally ends up in nature, does the presence of bacteria and fungi cause it to degrade. How quickly the degradation happens depends on environmental conditions (like moisture (rain), heat and sunlight).

Biomass

Biomass is organic feedstock especially of plant origin. These feedstocks are renewable and originally found in nature in the form of agricultural and forestry products like corn, wheat, sugar beet, sugar cane, rapeseed and woody plants. The residues of these products also contain starch, carbohydrates, fats and proteins.

Biorefinery/Biorefining

A biorefinery is a factory that processes biomass into a range of products and where the goal is to make the most efficient use of the biomass or raw material. Biorefining aims to use every component of the raw material so that nothing goes to waste thereby improving efficiencies and environmental impact. Dawn Technology is the brand name of Avantium's biorefinery technology, which converts non-food plant-based feedstock into industrial sugars and lignin.

Catalysis/Catalyst

A catalyst is a substance that enables and accelerates a chemical reaction. Catalysis is the process of using a catalyst in such a reaction. Catalysts are not consumed in the catalysed reaction and can be reused repeatedly.

Catalyst Testing

Catalyst testing is an important practice in the process of developing a new or improved catalyst. Over the years, Avantium Catalysis has executed numerous catalyst testing projects in the various phases of a catalyst development trajectory, from discovery and screening to process optimisation and commercial selection.

Circular Economy

A circular economy is based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems. Avantium works to advance new technologies for a more sustainable future. PEF plays a significant role in the circular economy.

Carbon Dioxide (CO₂)

A greenhouse gas (GHG) that originates as waste from the burning of fossil fuels and the production of electricity, fertilisers, chemicals, steel and cement. It is the biggest contributor to climate change. The development of electrochemistry has the potential to use CO₂ as a feedstock for the sustainable production of chemicals and materials, and is seen as a 'game-changer' for the chemical industry. The result is that this GHG is sequestered into products that can replace plastics and chemicals that are traditionally produced from fossil feedstock. Avantium's Volta Technology is the leading electro-catalytic platform developing CO₂ utilisation solutions for a circular future.



COVID-19

The disease resulting from the infection of the coronavirus variant identified in 2019.

Dawn Technology™

Dawn Technology is the brand name of Avantium's biorefinery technology, which converts non-food plant-based feedstock into industrial sugars and lignin. These sugars, such as glucose, are an excellent raw material for chemistry and fermentation processes and are used to produce a broad range of products.

Furandicarboxylic Acid (FDCA)

2,5-furandicarboxylic acid is an intermediate chemical for making PEF.

Flowrence®

Avantium's Flowrence is an advanced high-throughput platform for high-quality testing of catalysts and adsorbents.

The Flowrence system can be used for a broad range of industrial applications that operate in gas, vapor or trickle phases.

The parallel reactor system combines the reproducibility of larger-scale reactors with the advantages of small-scale reactors such as intrinsic safety, high accuracy, low costs per experiment and, ultimately, faster time-to-market.

Glucose

A sugar consisting of six carbon atoms (C6). It is a core building block for a bio-based economy. Glucose serves as a feedstock for the production of a broad range of chemicals and materials produced via chemistry or fermentation processes. The resulting products can be existing and new plant-based chemicals, such as plantMEG and plantMPG.

Glycols

A glycol is any of a class of organic compounds belonging to the alcohol family. The term is often applied to the simplest member of the class: mono-ethylene glycol or MEG, a colourless, oily liquid. Avantium has developed plant-based MEG, a vital ingredient for the production of polyester textiles and film, PET and PEF resins and engine coolants.

Life Cycle Assessment (LCA)

The compilation and evaluation of the input, output and potential environmental impact of a product system throughout its life cycle. LCAs are fundamental to understanding how Avantium's technologies compete with fossil-based alternatives. LCAs form the bedrock of how we measure our footprint and describe the sustainability benefits of our innovations.

Lignin

In the Dawn Technology biorefining process, lignin is the mass remaining after the sugars have been removed from the initial raw material. It is very efficient for energy generation as its energy content is up to 40% higher than the original wood chips used in the process. Energy generation is currently the predominant application for lignin. Additional higher value applications are being developed, including bio-asphalt.

Management Board and Management Team

The Management Board (consisting of the CEO and the CFO) is Avantium's statutory executive body and is, together with the management team, (the CEO, CFO, CTO, General Counsel and the Managing Directors of the business units), responsible for the day-to-day management of Avantium.

Mono-Ethylene Glycol (MEG)

MEG is a vital ingredient for the production of polyester textiles and film, PET and PEF resins and engine coolants. End uses for plant-based MEG (plantMEG) range from clothing and other textiles, to packaging, kitchenware, non-toxic coolants (eg.

antifreeze) and solvents (eg. paint and coatings). Ray Technology™ is the brand name of Avantium's technology to produce plantMEG™.

Mono-Propylene Glycol (MPG)

MPG is a valuable intermediary and is used in airport operations for the de-icing of airplanes, it is also used in unsaturated polyester resins, for example in modern windmill blades, as well as heat transfer fluids. Ray plantMPG™ is a wholly plant-based version of MPG.

Polyethylene Furanoate (PEF)

PEF is, a polyester made from MEG and FDCA. PEF produced by Avantium's YXY® Technology is a 100% plant-based and recyclable polymer that can be used in an enormous range of applications, including bottles, packaging, textiles and film. PEF's barrier and thermal properties are superior to conventional PET. In combination with a significantly reduced carbon footprint, the added functionality gives PEF all the attributes to needed become the next-generation polyester.

Polyethylene Terephthalate (PET)

PET is a, transparent polyester used for bottles and film. Currently PET is made from fossil-based MEG and fossil-based terephthalic acid.

Polyesters

Polyesters are polymers formed from a dicarboxylic acid and a diol. Polyesters are very stable and strong and are particularly useful in making fibres for clothing or plastics. Polyesters are most commonly found as either PET or PEF.

Polymers

A polymer is a chemical compound with molecules bonded together in long repeating chains. The term "polymer" is commonly used today in the plastics and composites industry, and it is often used as a synonym for "plastic" or "resin."



Ray Technology™

Ray Technology is the brand name of Avantium's technology to produce plantMEG™ and plantMPG™.

Renewable Resources

These are agricultural or forestry raw materials used as feedstock for industrial products. The use of renewable resources by industry saves fossil resources and reduces the amount of GHG emissions.

Sustainable Development Goals

The United Nations launched its 17 Sustainable Development Goals in 2013.

Throughput

The volume of chemicals a system can process per hour.

Volta Technology

Avantium's Volta Technology, a carbon capture and utilisation (CCU) technology, is the leading electrocatalytic platform developing CO₂ as a feedstock for a circular future.

YXY® Technology

Avantium's YXY® technology helps to produce a wide range of novel 100% plants-based materials and products by converting plant-based sugars (fructose) into plant-based chemicals (e.g. for the production of biobased plastics, such as PEF).

1st Generation Feedstock

Carbohydrate-rich plants such as sugar beet, sugar cane, corn and wheat that can also be used as food or feed and for making plant-based chemicals and materials.

2nd Generation Feedstock

Non-food feedstock resulting from agricultural and forestry waste or residual streams. Dawn Technology™ is the brand name of Avantium's biorefinery technology, which converts non-food plant-based feedstock into industrial sugars and lignin



If you have any questions or remarks regarding this report,
we invite you to contact us.

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