CO_2-Neutral Chemical Industry

The Challenge of an Industry Transformation

The European Chemical Industry has set out on an ambitious path to become carbon neutral. Germany, as one of the major chemical manufacturing nations, has committed to achieve this goal by 2050. But companies need to translate this industry vision into their specific context.

System changes of the scale of CO_2 neutrality for a whole industry sector require a new mindset. Major transformations command long lead times and require consistent and persistent follow-through. It is all but clear whether enough value is created to justify the huge investments and how new value generated is distributed among critical players and investors.

CHEManager asked executives and industry experts to share their opinions on this industry transformation, which is a multi-stakeholder challenge and comprises economical, technical, societal and political aspects. We proposed to discuss the following aspects:

- What is your strategy / timeline to become carbon neutral and what are the key challenges on the path to achieve this goal?
- What political / regulatory measures are needed to encourage companies to invest in carbon neutral technologies?
- What economical / societal benefits do you expect or hope for by decarbonizing your business?
- How do you plan to involve external stakeholders critical for achieving CO_2 neutrality?

Read the insightful answers of the experts on the following pages.

People. Planet. Paint.

Wijnand Bruinsma, Program Manager Sustainability, AkzoNobel

"Tackling climate change by reducing carbon emissions is a global imperative."

Tackling climate change by reducing carbon emissions is a global imperative that features prominently on the agenda of governments, corporates, NGOs and civil society organizations. Reducing emissions demands an integrated, collaborative approach across industries and value chains.

We strive to lead our industry by pioneering a world of possibilities by empowering people, reducing our impact on the planet and consistently innovating to deliver the most sustainable solutions for our customers. That's why we call our approach to sustainable business — People. Planet. Paint.

In 2017 we announced our long-term goal to be carbon neutral by 2050 and set an ambition to reduce carbon by 50% in 2019 (off a 2018 baseline with no offsetting). We are on track to achieve our 50% ambition and made good progress in 2020 having reduced carbon emissions by 19%.

Carbon reduction is achieved by reducing our energy consumption and operating on 100% renewable electricity by 2030 (2025: >50%). We currently have 34 locations and 12 countries on 100% renewable electricity and have set an ambition to reduce energy use by 30% in 2030 (2025: 15%).

Our sustainable product portfolio accounts for 40% of our sales and our ambition is to increase this percentage to >50% by 2030. Our sustainable solutions help reduce energy consumption and thus carbon emissions in the coating application phase and in the use phase of the coated end-product. We develop paints and coatings products with low embodied carbon through water-based low VOC technologies, and reduced and renewable materials usage. Our longer lasting solutions protect substrates longer thus reducing carbon emissions from repair and renewal activities.

AkzoNobel actively contributes to the UN SDGs and we support global programs and organizations like the EU Green Deal, Renovation Wave and CEO Alliance amongst others. We are also a proud member of the World Green Building Council.

Climate Stimulus Packages for Industry

Rudolf Staudigl, President and CEO, Wacker Chemie

"Crisis management as the catalyst for a climate-neutral transformation."

The economic fallout of the coronavirus pandemic poses exceptional challenges to industry — and energy-intensive companies in particular. Transforming industry and putting it on a path toward climate neutrality while strengthening its ability to innovate and compete in today's difficult economic climate will require new political tools.

Europe's energy-intensive, basic-materials industry needs a stable industrial electricity price in order to compete on a level-playing field with Northwest China and other regions.

Otherwise, industrial processes and energy procurement cannot reach climate neutrality by 2050 without the loss of competitiveness and business.

For Germany, Wacker proposes that roughly 120 TWh per year should be made available on an annual basis to the energy-intensive industry at a maximum price currently set at 40 €/MWh. The price level however needs to be flexible, as the reference point for effective carbon leakage protection is never the absolute price of electricity, but always defined as the relative difference to that paid by international competitors. The typical international costs of generating electricity from coal could serve as an index, as could a mix of international industrial electricity prices from relevant competitor regions.

Domestic production of renewable electricity must at least double by 2030. The success of energy-intensive industry's transformation will depend on an ambitious expansion of renewable energy and power distribution grids. Renewable energy represents the backbone for climate protection in German and European industry.

Over the past few years, we have achieved substantial progress on both the political and technological front — from energy storage and electromobility to global climate agreements. The coronavirus pandemic is no reason to let down our guard with respect to climate change. It is instead a call to set the right course for the future now.

Innovations, not Emissions

Martin Babilas, Vorstandsvorsitzender, Altana

"Policymakers need to promote renewable energies much more strongly and swiftly."

We want to leave our footprint on innovations, not on emissions. Therefore, we have already consistently pursued an ambitious sustainability course for many years. Currently, we are on target to reduce our CO_2 impact from production and energy procurement worldwide to zero already by 2025.

We believe that industry plays a decisive role in driving forward global climate protection. But the climate protection targets cannot be achieved without sufficient electricity from renewable energies at competitive prices and the corresponding grid infrastructure. Therefore, policymakers need to promote renewable energies much more strongly and swiftly. Incentives must be created to ensure that sufficient electricity and heat energy from CO_2 neutral sources will continue to be available in the future.

Furthermore, policymakers should create comparable competitive conditions for the industry with internationally uniform CO_2 pricing.

As more and more companies strive to become climate neutral themselves, the need for our experience in researching and developing innovative solutions that make industrial and consumer products more sustainable will even rise. Wire enamels from Altana's Elantas division, for example, are increasingly being used in electric vehicles and extend their service life. Byk offers a solution for the recycling of polypropylene in car batteries, which was previously not recyclable. An aluminum pigment in wall paints developed by our Eckart division ensures that up to 50% of the heat is radiated back from the walls into the room. And a PVC-free seal from the Actega division helps beverage bottlers save 10,000 tons of steel for their crown caps.

With regard to our suppliers, we have set up a program to consistently further improve the CO_2 balance of purchased raw materials.

Helping People and the Planet Thrive

Delf Bintakies, Head of Ecological Footprint, Bayer

"Politicians must set the right incentives for climate-friendly agriculture."

Our sustainability strategy aims to help more people thrive and to decrease the ecological footprint — according to Bayer's vision: "Health for all, Hunger for none."

Regarding the ecological footprint, we aim to be climate neutral in our own operations by 2030. Therefore, we will reduce our emissions by 42% through energy efficiency measures and converting 100% of the purchased electricity to renewables. The remaining emissions will be offset by purchasing certificates from climate protection projects with recognized quality standards. Our targets are in line with the Paris Agreement's goal to limit global warming to 1.5 degrees Celsius.

Additionally, we will reduce greenhouse gas (GHG) emissions in our value chain (scope 3) by 12%. These targets have been approved by the Science Based Targets Initiative. Until 2050 we have committed to being Net Zero along our entire value chain.

To achieve these targets, we need stable and predictable access to large amounts of renewable energy and raw materials with a low CO_2 footprint at competitive pricing. Reduction in the value chain will only be successful through broad collaboration and advancements in calculation methods and transparency. Bayer drives these efforts through the sustainability initiative of the chemical industry, Together for Sustainability, TFS.

Beyond our industrial footprint, Bayer will work with farmers to reduce the ecological footprint of agriculture, which currently accounts for about 25% of GHG emissions worldwide. We want to help reduce GHG emissions by 30% per kilogram of crop yield in major agricultural markets where Bayer is active by 2030.

Politicians must set the right incentives for climate-friendly agriculture, especially in the downstream supply chains, to support this. Uniform certification must be supported and promoted to raise the GHG reduction potential in the agricultural sector and give farmers planning security for participation in voluntary carbon markets.

Turning Sustainability into Business

Stefan Haver, Head of Sustainability, Evonik

"Addressing the opportunities underlying sustainability as a guiding economic principle."

Evonik is committed to acting in line with the Paris Agreement, aiming for climate neutrality by 2050. In fact, this is easier said than done. Which makes it all the more important that we focus not only on the ambition itself, but also keep a close watch on the stepping-stones that will take us there. We can do so by addressing the opportunities underlying sustainability as a guiding economic principle and driver for innovation, resulting in questions like: How do we highlight our contribution as an enabler of CO_2 reductions in many other sectors? Or: How do we translate sustainable development into proper earnings? We can also take a more risk-based approach, asking: How do we account for the impact of climate change and resource scarcity on our business? At least: How do we make our portfolio more robust?

Our sustainability strategy is derived from the above questions, simultaneously aiming at four dimensions: exploring opportunities as well as risk mitigation, the footprint of our production as well as the handprint of our products. Consequently, it is deeply embedded in our company's purpose itself: Leading beyond chemistry to improve life today and tomorrow.

For the footprint-related part we have announced our target of reducing absolute emissions by half by 2025, compared with the baseline of 2008. For the coming years this is a reduction path of 3% a year, underpinning our commitment to the Paris Agreement. This is supplemented by internal CO_2 pricing, calculated using the baseline of €50 per ton CO_2.

On the handprint side of things, we are fostering sales from our most advanced products, that come with a proven sustainability benefit above market level. These A-ranked products form what we call our "next generation solutions". Having analyzed all of our businesses we can profoundly say, that Evonik generates about 90% of its sales with products or solutions that are on or above the market reference point in terms of their sustainability performance. More than 30% of our products and solutions even meet the highest standards of our next-generation-solutions category.

So, to Evonik the challenge of industry transformation comes with a strong message: It is not just about going green. It is all about business itself.

Responsibility for our Planet

Walmir Soller, Vice President Olefins/Polyolefins, Europe and Asia, Braskem

"The opportunities for action by far exceed the risks of inaction."

The race to zero emissions is on — and Europe has firmly set its eyes on becoming the first carbon-neutral continent by 2050. All of us in the chemical industry, in Europe and globally, do have big a role to play as we share a responsibility for our planet. The scale of the risks from climate change, deforestation and water scarcity for the economy is huge — however, we also know that the opportunities for action by far exceed the risks of inaction. The private sector's leadership will create a ‚cycle of ambitions' for greater government action and will ensure that global intentions for a sustainable net-zero economy become a reality.

Braskem has been committed to sustainability since our creation in 2002, and we consider ourselves to be a pioneer in the production of biopolymers. During ten years of growing sales, for example, the materials from our 'I'm green portfolio', which comprises products focusing on the circular economy, have helped avoid the emission of 5.54 million tons of CO_2-equivalent alone. And in November 2020, Braskem has announced an expansion in its efforts to become carbon neutral by 2050. To achieve this ambitious target, we will launch material initiatives for carbon reduction, offsetting and capture, expand our 'I'm green portfolio', and ensure the proper disposal of 1.5 million tons of plastic waste. And we will continue working on chemical recycling to provide the missing link for a circular plastic chain.

Due to our efforts, Braskem again was selected as a leading company on the Climate List for the sixth year in a row by the non-profit Carbon Disclosure Program (CDP) in 2020, underscoring our engagement and positive impact on our way towards a circular economy in the chemical industry. We all still have some way to go, but we are ready to play our part together with our partners in the industry. Our initiatives for the coming decades are aligned with the UN 2030 Agenda, its 17 Sustainable Development Goals and the Paris Agreement to control impacts from climate change.

Avoiding and Decreasing Value Chain Emissions

Lucrèce Foufopoulos, Executive Vice President Polyolefins, Innovation & Technology, Borealis

"Climate protection and economic success must go hand in hand."

Without any doubt, climate change is our biggest threat on a global scale. Therefore, we at Borealis see it as our responsibility to reduce our carbon footprint, as well as our products' total life-cycle emissions. We firmly believe that climate protection and economic success must go hand in hand, to ensure that the innovations needed for global climate protection continue to be developed. We also believe that a real step change can only be achieved through intra- and cross-sectoral cooperation, as well as developing robust internal pricing that stimulates companies to permanently reduce CO_2 emission.

Whilst it is essential to decrease emissions in our operations, we are also contributing to both avoiding and decreasing value chain emissions during the life cycle of the solutions we enable with our innovative and value-add product portfolio.

We continue driving the circular economy, reducing end-of-life emissions from plastic waste by designing for recycling, increasing recycled content or using chemically recycled feedstock. We will also reduce total life cycle emissions by using renewable energy and feedstock.

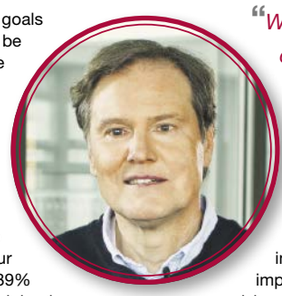
We are committed to reducing the carbon footprint of our operations to ensure we are climate neutral by 2050 or sooner by sourcing renewable electricity to avoid emissions, by continuing to implement energy efficiency improvements and zero continuous flaring, to reduce emissions, and by driving innovation to find solutions for end-of-pipe CO_2 emissions.

We have set the following goals in our journey towards climate neutrality by 2050, or sooner: Source 50% of electricity from renewable sources by 2030, to reduce indirect (scope 2) emissions that are caused by electricity consumption. And implement energy efficiency improvements equal to 20% of the absolute energy consumption in 2015 by 2030.

To reach net zero for scope 1 and 2 emissions, Borealis will go beyond the targets set out above and is therefore exploring opportunities to handle emissions as they arise through carbon capture and utilisation projects.

Keep Pushing for Energy Efficiency

Heinz-Jürgen Bertram, CEO, Symrise



"We integrate suppliers into our climate strategy."

We have set ambitious goals and expect not only to be carbon neutral, but to be climate positive by 2030. As interim goal, we want to reduce our CO_2 emissions in terms of value added by 60% by 2025 compared to the base year of 2016. Via the CDP Supply Chain Program, we integrate suppliers into our climate strategy. By now, 89% of our main suppliers have joined, meaning Symrise has far exceeded its Science Based Target (SBT) of 80%. The key challenge is our dynamic growth. As we are growing especially in the emerging markets with rising incomes, we want to offset the impact of rising sales while minimizing greenhouse gas emissions in our value chain. In order to accomplish this, we keep pushing for energy efficiency in our production facilities.

Focus on the Low Carbon Technologies of Tomorrow

Ralf Brinkmann, President Dow Germany, Central Europe, Italy, Israel and Greater Russia

"The EU Green Deal is both, an opportunity, but also a challenge."

We at Dow are committed to the Paris Climate Agreement and the EU Green Deal. In 2020 Dow set new targets to reduce GHG emissions, stop plastic waste, and drive toward a circular economy. We intend to be carbon neutral by 2050 and are committed to implementing and advancing technologies to manufacture products using fewer resources and that help customers reduce their carbon footprints. Hydrogen, alternative feedstocks, recycling technologies, circular economy and CO_2 reduction are the most pressing topics of the future. We believe that collaboration with the right partners from the industry, politics, NGO´s, research and science institutes will bring the most value to reach this goal.

However, for us as a globally operating Material sciences company the EU Green Deal is both an opportunity, but also a challenge. Our industry, mainly being increasingly exposed to carbon leakage, needs a reliable political framework now for investments in tomorrow's low-carbon technologies. This is essential to achieve our goal of carbon neutrality by 2050 and includes a reliable and cost-effective supply of green energy, which must be available in large quantities. In addition, markets must credit and refinance CO_2-free or CO_2-reduced products through the pricing of products. This is crucial to maintain our international competitiveness through the transition period and to support investments in low-carbon technologies until a global playing field is realized.

Committed to Speeding up Transformation

Richard Haldimann, Head of Sustainability Transformation, Clariant

"We have made carbon reductions bonus relevant."

Addressing climate risks and opportunities has been embedded in Clariant's sustainability journey over the past 10 years, but we are committed to speeding up our transformation. Our vision is to be carbon-neutral by 2050. To get there, we have just committed to ambitious 2030 climate targets, approved by the Science Based Targets initiative. They set out absolute reductions in emissions from our operations and purchased energy (-40%) as well as from our raw materials (-14%).

These new science-based targets are complemented by other targets to ensure continuous improvement in our environmental footprint, in all important parameters by 2030. The biggest lever we have as a specialty chemical company in supporting customers in their transition to a climate neutral economy is through our enabling solutions, be it low carbon intensity surfactants or catalysts.

Internally, we are both steering and incentivizing the improvement of our carbon footprint. Like applying carbon pricing for evaluating capital expenditures, reflecting our support for a global CO_2 price. Clariant will focus on improving energy efficiency through digitalization and increasing the use of low carbon electricity and fuels. To ensure this stays high on the management agenda we have made carbon reductions bonus relevant.

Outside of our operations, we are accelerating innovation in our value chains with increased use of waste streams and sustainable bio-based materials. For example, our high performing, EcoTain labelled glucamides for personal care are based on renewable sugars. They demonstrate a significantly reduced carbon footprint versus alternatives.

Clariant sees partnerships as critical for achieving CO_2 reductions. Examples include our strategic collaborations with sustainable raw material suppliers and customers to help decarbonize value chains. Such as with Neste for low carbon intensity raw materials used in flame retardants, and Carbon2Chem, a cross-industry project for the reduction of industrial CO_2 emissions in steel production.

Circular Raw Materials and Renewable Energy

Christian Haessler, Global Program Lead Circular Economy, Covestro

"Circular economy must become a global guiding principle."

To become climate neutral along its entire value chain the chemical industry has to switch from fossil-based to circular raw materials and renewable energy. Circular economy must become a global guiding principle to achieve this.

The chemical industry is as a solution provider to many industries ideally positioned to push this transformation towards a circular economy forward, break new ground in the development of those circular and renewable raw materials. At Covestro we are already integrating biomass into production, developing innovative recycling technologies to retrieve raw materials and even use CO_2 as another raw material source for our high-performance materials. Plastics are indispensable for a more sustainable, climate-neutral future. However, carbon, as a central plastics component, has to be kept in circle as far as possible. For example, the potential for industrial use of CO_2 as a raw material has never been better and the journey only just started. CO_2 is already used as raw material for plastics, basic chemicals, proteins, and many others. Covestro is a pioneer in this area. Since 2016 we produce polyols with up to 20% CO_2 under the brand name Cardyon using CO_2 from waste gas streams from a neighboring chemical plant. The CO_2 is chemically bound in the polyol where it cannot escape and thus serves as basis for a variety of applications such as foam for mattresses and automotive interiors, binders for sports floorings or elastic textile fibers. A good example is the EU Green Deal promoting CCU (Carbon Capture and Utilization) projects.

At Covestro, it is our vision to becoming fully circular and we align our company toward this vision with the ultimate goal to lead raw materials and carbon in loops, over and over and switch our energy supply to renewable sources.

Encouraging Policies and Regulations

Tatsuhiko Tokunaga, General Manager, Sustainability Strategy Planning Department, Asahi Kasei

"We believe that accelerating decarbonization will lead to business growth."

Asahi Kasei is working toward the realization of a carbon-neutral and sustainable society based on the „Care for Earth" policy anchored in our current mid-term plan. Regarding CO_2 reduction, we are taking a two-pronged approach of reducing emissions from our business activities and providing materials and technologies that allow for reducing CO_2 in society. As society progresses to decarbonization, we believe that accelerating decarbonization of our products will lead to our business growth. Because of the unique portfolio, Asahi Kasei is able to work on a carbon-neutral and sustainable society from various perspectives, not only in regard to basic chemicals but also by leveraging our expertise in the fields of housing, healthcare, electronics, hydrogen, as well as for materials for next-generation batteries and automotive in general. We believe that this approach allows for synergies that will profoundly contribute to a sustainable society.

Encouraging companies to invest in carbon neutral technologies is the right approach. Carbon neutrality is obviously a big challenge for all companies and society in general. We believe that this can be achieved by the effort of each single company, supported by encouraging policies and regulations that support these activities and pave the way for social systems harmonizing with decarbonization.

Achieving CO_2 neutrality requires global companies to take global efforts. With R&D laboratories in Japan and Germany and Corporate Venture Capital offices in the United States, Germany and China, we are in close contact with partners, suppliers and start-up companies around the globe, aiming at incorporating the most advanced technologies to support our efforts.

Transition to a Carbon-neutral Lifestyle

Uwe Bergmann, Head of Sustainability Management, Henkel

"We aim to become a climate-positive company by 2040."

The next five years will be decisive, whether we as a society will manage the transition to a carbon-neutral lifestyle, reducing the pressure on our resources and reach the well below 2-degree target of the Paris Agreement. We at Henkel want to lead the change and therefore committed to an ambitious long-term vision: we aim to become a climate-positive company by 2040. This means decarbonizing our own operations and supplying surplus carbon-free energy to third parties.

At our production sites, we have identified both the potential to further increase energy efficiency and to convert all remaining fossil fuels to climate-neutral alternatives. Our aim is to reduce our production-related carbon footprint by 65% by 2025.

In addition to our activities at our own sites, we want to leverage our influence on areas of our value chain that are particularly relevant to CO_2 emissions. Responsible sourcing is one approach that we realize by cooperating with our suppliers. The industry-wide responsible sourcing initiative Together for Sustainability, TFS, co-founded by Henkel in 2011, is only one example.

Finally, the most important approach for Henkel's CO_2 reductions lies in the use phase of our products, accounting for around two thirds of our carbon footprint. Therefore, we have developed a CO_2-saving portfolio to help our customers and consumers save 100 million tons of CO_2 in a ten-year-period until 2025 by using our products and solutions.

We are convinced that our strategy to create more value, while reducing our environmental footprint, makes an important contribution to climate protection and is the way to lead our company to future success.

Climate Protection is a Business Case

Hubert Fink, Member of the Board of Management, Lanxess

"We need fast approval procedures for emission-reducing technologies and energy-efficient plants."

When my colleagues and I decided in 2019 that Lanxess should become climate-neutral by 2040, we were guided by two ideas: First, we have a responsibility to contribute to the Paris Agreement's goal of limiting global warming to less than two degrees Celsius. Second, we see the business benefits. We will become an increasingly sustainable partner for our customers in the coming years. And thanks to greater resource efficiency, we will save costs in the long term. In a nutshell, climate protection is a business case.

Of course, it is first and foremost up to us to achieve the goal of climate neutrality. Only recently, we put a plant into operation at our Antwerp site to reduce nitrous oxide, which emits during the production of the plastic precursor caprolactam. A second facility will be added in 2023. In India, we are converting our energy supply to renewables. This has already been achieved in Brazil. At our major sites on the Lower Rhine, Germany, we will only use natural gas in the mid-term, which is more climate-friendly than coal. With our focus on specialty chemicals, we will do more business with lower emissions in the future. Our research focuses more strongly on climate-neutral process and technology innovations. All of this requires investment, but it pays off in the long term, for our business and for the planet.

However, the transformation to climate neutrality is not solely in our hands. We need political support. In Germany, for example, we urgently need more green energy, and at competitive prices. It is also essential that the European emissions trading system remains functional and that there is no double burden from national systems. Finally, yet importantly, we need simple and fast approval procedures for new, emission-reducing technologies and energy-efficient plants.

Return to Reasonable Measures

Bernhard Hettich, Chief Technology Officer, CHT Group

"The regulatory effort from the European legislation bears the risk of deindustrialization."

CHT has integrated sustainability into its midterm strategy 2025. Becoming a carbon-neutral company requires affordable energy with a sufficient share of renewably generated electrical energy, as pointed out in VCI's statement.

For CHT as a specialty chemicals provider for multiple industries the transformation to climate neutrality means to analyze and evaluate the whole value chain upstream and downstream including the customers' processes. This will be done in a systematic and comprehensive way by means of science-based targets, SBT, to make sure that each individual measure adequately contributes to the target achievement.

CHT drives its business in the focus of sustainability, well balanced on the three pillars ecology, economy, and social aspects.

However, the relentless regulatory effort from the European legislation bears the risk of vast deindustrialization in Europe, which happens in very small but manifold steps. 30 years from now, the results of the ideologically driven legislation activities of the last 10 years, today and the coming decades cannot be corrected anymore.

Therefore, we are urging now the European legislation to return to reasonable measures as their responsibility to enable the chemical industry to remain in Europe and to become climate neutral according to its self-commitment.

Leveraging Science and Technology

Herwig Buchholz, Head of Group Corporate Sustainability, Merck

"Sustainable entrepreneurship and profitable growth go hand in hand."

At Merck, reducing our greenhouse gas emissions is a core element and one of the three goals of our sustainability strategy: By 2040, we want to be climate-neutral —not just in terms of emissions at our own sites and from energy purchases, but along the entire value chain.

This goal cannot be achieved without major changes. Starting with our product developments, we are already working to reduce our greenhouse gas footprint through a wide range of initiatives and projects. Cutting down on energy consumption, utilizing renewable energy sources, and minimizing our process emissions are key elements of our climate mitigation efforts.

In recent years, we have focused on reducing greenhouse gas emissions through energy efficiency projects. We are continuously improving the energy efficiency of our buildings as well as our research and production activities by adapting and modernizing them. In addition, we are working to reduce process-related greenhouse gas emissions and emissions from our own energy generation. Since 2019, we have increasingly been purchasing electricity from renewable sources, and we are committed to engage in green virtual power purchasing agreements.

However, it is also clear that climate change is a global challenge that can only be resolved together. And while global attention to the issue is important, solutions are even more important. We need different, visionary approaches in many areas. For example, agriculture is a huge producer of CO_2. A recent United Nations report calls on people everywhere to substantially cut down on their meat consumption in order to help save the planet. That is why we are committed to the topic of clean meat: meat grown in the lab has the potential to significantly reduce greenhouse gas emissions.

We are working closely with a broad range of partners across different sectors — including academia, start-ups, non-profits and large corporations. Our ambition is to leverage science and technology to achieve lasting progress for mankind. For us, sustainable entrepreneurship and profitable growth go hand in hand.

Creating a Powerful Coalition

Zanna McFerson, Managing Director of the Renewable Chemistries, Avantium

"Weaning away from fossil-based resources on a global scale is happening too slowly."

Avantium's path to achieving carbon neutrality looks at a number of different areas, including our technologies, operations, people and leadership. We have outlined several measurable goals for these, such as achieving 1.5 million tons of CO_2 savings and a fully carbon neutral operation by 2030. We are also mobilizing our colleagues and the next generation of scientists, as well as focusing our leadership team's advocacy efforts. These goals have been put in place to help us accomplish our overall ambition of a fossil-free chemical industry by 2050.

The key challenge currently is that weaning away from fossil-based resources on a global scale is happening too slowly. Also, sustainable alternatives are still in the development stage and need to be scaled up in a cost effective and efficient way. At Avantium, we are applying our scientific and research expertise to improve existing processes and invent new technologies for the chemical industry, to not only address the world's dependency on fossil-based resources, but also create a more sustainable, circular future.

By setting our plans, we can hope to bring a number of economic and social benefits. We can engage with and educate the public on the impact of climate change, work with important stakeholders to fundamentally change the plastic value chain for the better, as well as collaborate with governments and industry associations to help inform the debate and shape climate policy.

We hope to galvanize many others that share similar values and are guided by the same end goals into action, so that together, we create a powerful coalition to reach our ambition of a fossil-free chemical industry by 2050. We not only want to be a leader in sustainability, but also create a ripple effect that draws others into action.

Improve, Grow, Engage

Vivi Hollertt, Chief Sustainability and Communications Officer, Nouryon

"We should not underestimate the drive of market forces."

Markets worldwide rely on our chemistry in the manufacture of products, such as paper, plastics, building materials, food, pharmaceuticals, and personal care items. That is why we believe that in addition to improving our eco-footprint, we also need to grow — to provide more sustainable products, more bio-based materials, more circular chemistry. And we can't operate in a silo: We serve our customers and at the same time also need to engage our employees and the communities in which we operate to drive progress together.

Improve, grow, engage: These form the three pillars or our sustainability approach 'Nouryon's Commitment to a Sustainable Future.' And we have a strong foundation to build on: We are a top-quartile performer in safety, we have reduced our carbon footprint per ton of product by almost a third since 2009, and we continuously grow sales from our more sustainable 'Eco Premium Solutions'.

When looking forward, we believe in making concrete steps right now, rather than focusing only on a distant future. Our next milestone is to reduce absolute emissions from our operations and energy use by 25% between 2020 and 2025.

But more importantly, we will grow our sustainable product portfolio as an integrated part of our business strategy to serve growing markets. For example, one of our largest recent acquisitions was in CMC, a cellulose product which supports the growth of more bio-based products for personal care, buildings and infrastructure, and other growth markets.

We strongly believe that sustainability will be a key growth driver in the coming years, and we should not underestimate the drive of market forces in pushing the large transformation in our industry.

Transformation — with a Sense of Proportion

Matthias Braun, Managing Director Active Ingredients, Sanofi-Aventis Germany

"Isolated European solutions or even ideological considerations will not lead to the goal."

Immediate coal phase-out, higher industrial electricity costs, binding targets — the demands in the discussion about more climate protection and a CO_2-neutral industry are diverse and occasionally exempt from all constraints. One can wish for a lot, demand even more — but one should also keep in mind a sensible and, above all, technically feasible implementation. Actionism does not help here. For we need both — climate protection and an economy that can hold its own in global competition. As a country poor in raw materials, Germany is dependent on a functioning industry that secures jobs and creates the prosperity that is necessary for an energy transition.

An energy transition cannot be achieved at zero. The central question is, what do we have to do, and can we do it?

The European Commission's Green Deal has set the goal of making the EU greenhouse-gas-neutral by 2050. At Sanofi, we will achieve this: We have set the goal of meeting our primary energy needs only from renewable sources by 2030 at the latest — and to be completely climate neutral by 2050. But one should not forget: What is a growth strategy from the EU's point of view is a major challenge for the chemical and pharmaceutical industry. For example, how do you make climate-neutral „green" steam, which as an energy supplier is crucial for production and operations? We will still have to find answers to such questions!

It is true that the deal contains the opportunity to strengthen Europe's competitiveness through new business models and technical innovations. But the Green Deal must become a Sustainable Deal that is implemented with a sense of proportion. For example, competitive electricity prices are essential for the switch to renewable energies and climate-friendly technologies.

Sanofi naturally supports ambitious and effective climate protection in Germany, the EU and worldwide. This must be implemented consistently. If not, there is a threat of relocation of production with negative effects. That benefits no one — and least of all the climate. So, isolated European solutions or even ideological considerations will not lead to the goal. Instead, it must be a matter of investing in research and improving existing concepts. Because we want to continue to be part of a modern, forward-looking society. That is why we are consistently pursuing our path towards climate neutrality.

Creating a Level Playing Field

Mark Williams, Vice President Europe, SABIC

"A collaborative approach between the private and public sector is needed."

While we support the EU Green Deal and transitioning toward a climate-neutral and fully circular economy, a collaborative approach between the private and public sector is needed to reach this ambition.

Alongside others, we want to work with the EU to create a level playing field. Access to affordable renewable energy and a reliable supply are key enablers of decarbonization, and both supply and public infrastructure continue to be a challenge. To accelerate our transition, we are pursuing a number of low carbon options including the development of a 100 MW solar plant to power our operations in Cartagena and we are investigating further opportunities for electrification across Europe — but on-site solutions are not always practical or possible. There is a role for industry to play in working with policymakers to ensure the right resources are in place.

In many cases, current energy efficiency initiatives and technologies are reaching their limit and investment is needed to research, develop and deploy new solutions. Policy reform is needed to drive and support innovation, and public demand for low-carbon and circular products is essential.

If policies like the ETS could account for all emission reduction savings including scope 1 from direct emissions, scope 2 from renewable resources and scope 3 from chemical recycling — or the cap was adjusted — industry would be more open to taking risks and revenues could be recycled to offset the cost of developing or introducing carbon-neutral technologies. In turn, Europe would be able to maintain its competitiveness and technological leadership throughout the world. Care is required with EU protective measures like carbon pricing schemes and border adjustment measures as they can have unintended consequences that further limit our ability to be competitive.

We will continue to invest in low-carbon-emitting technologies, but time is short and collaboration is vital. We are working with CEFIC to ensure that we achieve the goals of the EU Green Deal in parallel with growing our business in Europe and demonstrating global leadership. The challenge is too great for one company or organization; we work together to make a climate-neutral future happen.

Driving the Plastic Circular Economy

Samia Nehme, VP Chemicals Europe and Africa, Global Excellence and Product Stewardship, Shell Chemicals

"Plastic end products bring important benefits to society."

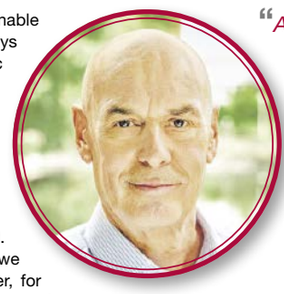
Our ambition at Shell is to become a net-zero emissions energy business by 2050 or sooner in step with society and our customers, and our chemicals business has a vital part to play. We aim to be net-zero emissions from making our products and to reduce the carbon intensity of the products we sell. We will also work with sectors which use energy to help them find their own path to net-zero emissions.

We are looking at four main areas to drive down CO_2 from our chemicals production: Firstly, each of our chemical plants is improving energy efficiency, through investing in things like heat and gas recovery systems, hybrid boilers and new catalysts. Secondly, our production sites are increasingly using lower-carbon energy sources such as solar and hydrogen, which Shell's New Energies business is playing a leading role in developing. Thirdly, we are exploring carbon capture and storage (CCS) options, to capture the CO_2 emissions our facilities produce. And lastly, we are developing alternative feedstocks for making our chemicals, such as biomass and plastic waste.

Plastic end products bring important benefits to society - helping to improve living standards, hygiene, and nutrition. Shell, like others, wants to be part of the solution to the growing problem of plastic waste. We are developing new technology to use plastic waste as an alternative feedstock to make our chemicals. We are making good progress toward our ambition to use 1 million tons of plastic waste every year in our facilities by 2025. At Shell Chemicals, driving the plastic circular economy is a key part of our growth strategy.

Sustainable Corporate Management Pays Off

Bernhard Kott, Chief Sustainability Officer, Symrise



"Ambitious sustainability management reinforces long-term partnerships."

I am convinced that sustainable corporate management pays off — not least in economic success. We contribute to the UN Sustainable Development Goals (SDGs) and global efforts to stop global warming. Our shareholders and investors are paying greater attention to this commitment. If we act sustainably today, we can avoid higher costs later, for example due to regulatory requirements, reputation losses or — last but not least — our dependence on natural raw materials. Thus, analysts and rating agencies such as MSCI, Sustainalytics, ISS ESG, CDP, EcoVadis and SEDEX increasingly ask us about our ESG performance. Also, an ambitious sustainability management reinforces long-term partnerships with our suppliers and local communities — and is demanded by our employees. Where necessary, Symrise compensates emissions through climate certificates, preferably by funding projects where we operate. The impact can be better monitored and employees and the population in the region benefit directly from the measures.

Technologies for Tomorrow's Challenges

Jürgen Vormann, Chairman of the Management Board, Infraserv

"We need pragmatic sustainability policies in Germany and Europe."

The Covid-19 pandemic currently dominates the headlines and has displaced sustainability and climate change from the top of society's agenda. However, these issues have lost none of their urgency or significance for the chemical and pharmaceutical sector.

It is my hope that the sustainability debate will — for various reasons, and not just in response to the economic fallout from the pandemic — become less one-sided in the future than it was before the pandemic, when climate protection activities were demanded at times without considering how they would affect Germany's competitiveness.

We need pragmatic sustainability policies in Germany and Europe — policies that target ambitious but achievable goals and acknowledge the realities of global competition instead of focusing on the crowd-pleasing appeal of a "green new deal". That will only happen if we have a critical, constructive and solution-driven debate, not a dogmatic and occasionally one-dimensional vision of sustainability that is geared toward the political mainstream. Sustainability policies that ignore socio-economic facts and allow value generation to be offshored outside Europe quickly lose their claim to being sustainable. Indeed, they run the risk of creating more numerous and serious problems than they purport to solve.

The chemical and pharmaceutical industry has always driven the kind of innovation that is so essential to developing new energy, healthcare, transportation and environmental technologies. It has thus done much to help achieve climate targets, make Germany a socio-economically sustainable place to do business and provide environmentally relevant technologies for tomorrow's challenges. It is thus in all our interest to do everything we can to give the chemical and pharmaceutical sector a future in Germany and Europe.

Chemical Industry: a Key Player in Climate Protection

Thomas Wagner, CEO, GETEC

"Every industry must review its entire value chain."

Decarbonization is probably the strongest driver of transformation today. Only if every sector makes a significant contribution to reduce greenhouse gases (GHG), climate neutrality in 2050 according to the EU Green Deal will succeed. To achieve these goals, every industry must review its entire value chain.

The chemical industry is one of the main emitters of CO_2. Therefore, a holistic view to tackle GHG is required. From sourcing of raw materials not only from oil and the improvement of processes for the incorporation of CO_2 in products, to energy used and materials and gases recycled in order to get to net zero production.

This transformation comes at enormous speed with many new regulations in the introduction phase. On top of political and consequently regulatory framework, the capital markets require very clear and dedicated ESG strategies to commit to this transformation. Thus, a major focus of top management is needed, major investments, major knowledge and speed are necessary to tackle that challenge. This is when outsourcing is being considered by most chemical companies — when focus and resources needs to be on core processes. Therefore, a strong partner is required in order to manage speed and complexity.

In addition to the provision of highly efficient energy solutions, innovative energy service providers such as GETEC have developed further solutions for their chemical customers based on the Waste2Value approach. For example, in the thermal utilization of highly climate-damaging special gases such as nitrous oxide or vent gas out of production or storage. Or in the completely climate-neutral energy supply of Clariant's new production site in Romania. Here, Clariant produces bioethanol from wheat straw, while GETEC uses the residual lignin for the energy supply. Doubly innovative and sustainable.

These examples show, however, that the chemical industry should not only be considered in terms of its own scope, but also in terms of its additional climate-contribution as one of the main players. The entire future field of hydrogen synthesis, for example, will not work without according catalysts produced by the chemical industry. This is a more honest and holistic view of the chemical industry's contribution to CO_2 reduction and it offers considerable opportunities.

Playing a Pioneering Role in the Global Energy Transition

Frank Hyldmar, CEO, Currenta

"Green hydrogen can completely decarbonize production processes."

Currenta is part of the „European Alliance for Clean Hydrogen". The initiative, founded by the European Commission, supports the development of a clean and globally competitive hydrogen industry. It aims to contribute to the EU's goal of becoming climate neutral by 2050. The goals of the alliance fit perfectly with our ideas and convictions on sustainability. We want to make a substantial contribution with our know-how and infrastructure to establish the market for green hydrogen in the long term: as a basic material for the chemical industry, energy storage or fuel.

We want to play a pioneering role in the global energy transition. As a sustainable company, we are convinced of this and are playing our part in making the economy in Europe CO_2-neutral in the future. Clean hydrogen technology is one of the key technologies for the energy transition. Especially in the chemical industry, green hydrogen is seen as one of the alternatives to fossil fuels and can completely decarbonize production processes.

Currenta manages and operates three Chempark sites, in Leverkusen, Dormagen and Krefeld-Uerdingen. We can draw on a wealth of experience and in-depth knowledge in operating industrial plants and managing complex approval processes. The Chempark sites also have the necessary land and infrastructure such as electricity and gas grid connections. We therefore offer ideal conditions for establishing a regional hydrogen hub in the future.

In addition, hydrogen is already produced on site by steam reforming and chlor-alkali electrolysis and used in production by Chempark companies. In the future, climate-neutral hydrogen will continue to gain importance as a key raw material for a greenhouse-gas-neutral industry - also in other areas, for example in the mobility and logistics sector. The technical and investment challenges are huge. We operate one of the largest chemical parks in Europe. For us, one thing is certain: We will do our part to ensure that production there can be climate-neutral in the future.

Full Commitment and United Efforts

Clemens Mittelviefhaus, Managing Director, Yncoris

"Partnering and collaboration is key to success."

To become CO_2-neutral as industrial manufacturer is — in face of the challenges coming along with climate change — a question of inter-generational contract: This responsibility we all have to take for the benefit of the coming generations, for our kids and grandchildren! It will be the most ambitious challenge for all of us. And, as I do not know the one and single answer to this question: what I know is that we only will succeed if we all cooperate and follow one single goal — with full commitment and all united efforts.

Yncoris as a provider of technical services in maintenance and engineering and operator of a chemical site is fully integrated in these activities and takes responsibility in turning its own carbon footprint to neutral, but also offering services in site operation as well as in engineering and maintenance services to support customers on their journey toward minimizing CO_2-emissions. Therefore, we support and are engaged in collaborations and projects in search of extraordinary solutions in bioprocess technologies and circular economy.

Our responsibility it is to enable our employees to use open space for new ideas, provide adequate means and money and have the willingness to learn even from risks and failures on this path. Partnering and collaboration is key to success, politics have to set up appropriate legal framework conditions in the context of international competition.