Capital Markets Day 2021
Keynote “Our journey to net zero 2050”
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Ladies and gentlemen,

Thank you for joining our virtual Capital Markets Day.

The past year has been dominated by the pandemic. But we must not let this distract us from one of the greatest challenges of our time – climate change. And we have not neglected this important topic.

In today's keynote, I will show you that we are working hard on fundamentally new low-emission production technologies and processes. These will enable us to significantly reduce greenhouse gas emissions, especially in the production of base chemicals.

Based on our progress, we are stepping up our ambitions and commitments to contribute to the Paris Climate Agreement.

[Chart 2: Our commitments to reaching the Paris Climate Agreement]

Let me begin with our commitments:

- We want to reduce our absolute CO_2 emissions by 25 percent by 2030, compared with 2018.
- We are committing to achieve net zero emissions at BASF by 2050.

We are setting a more ambitious reduction target for 2030 and, for the first time, we are setting a target for 2050: net zero emissions! At BASF, we do not take such commitments lightly. Over the past three years, we have made great progress in developing new technologies. This gives us the confidence that we will be able to reduce our emissions faster than anticipated so far. While major emission reductions will kick in beyond 2030, we plan to realize some of them before 2030.

As we have said before, we have intensively analyzed the status quo. We have questioned habits and beliefs, started new process developments and developed bold, new ideas. We call this initiative our Carbon Management. And we are learning at a fast pace!

Today, we can tell you: It is technically possible to eliminate our CO_2 emissions almost entirely! Are all these steps economically feasible? Not yet. Some measures are already attractive today; others are challenging today but will be attractive in the future, with different regulations, lower prices for renewable energy, and higher CO_2 prices. Our journey to net zero will be an ambitious journey over decades. We need entirely new technologies and we need to use renewable energy on a large scale. But most importantly: We need to act now to get there. We are stepping up our efforts, and that is why we are committing to more ambitious reduction targets by 2030 to get to net zero by 2050. It is the first mile that makes the difference!

[Chart 3: Agenda – The levers for our transformation]

Let's first focus on key levers for our transformation.

[Chart 4: Leading the journey to transform the chemical industry]

We are in an excellent position to further lead the transformation of the chemical industry. We can build on our sound data base, our high technology expertise, and, in particular, the advantages of implementation at our deeply integrated Verbund sites.

- We are leading the net zero transformation of base chemicals including downstream value chains.
- We have extensive sustainability and operational expertise.
- We develop and invest in pioneering low-emission technologies.
- We implement them step-by-step in the Verbund to the benefit of our whole product portfolio.

With this, we demonstrate how we live up to our corporate purpose: We create chemistry for a sustainable future.

[Chart 5: Our path to reduce BASF emissions from 2018 to 2030]

This is our path to reduce our CO_2 emissions by 25 percent by 2030, compared with the 2018 baseline. To meet our new target, we will deploy six major levers. I will touch on all of them today to demonstrate that we are not just communicating a target, but are capable of delivering on our promises. Our measures are evaluated based on CO_2 avoidance costs and how they compare with each other. The final order in which they will be used depends on a number of factors. What is clear today is that renewable energy will play a key role, already between now and 2030, but even more so beyond 2030.

By harnessing the CO_2 avoidance potential of all of these technology levers, BASF could reduce its absolute CO_2 emissions by about 50 percent compared with the 2018 level. Our challenge is that BASF also wants to grow! Our target is to grow sales volumes faster than global chemical production. Consequently, this will lead to higher CO_2 emissions, which we need to more than compensate.

[Chart 6: Our path to reduce BASF emissions from 1990 to 2050]

Since 1990, BASF has already significantly reduced its CO_2 emissions by optimizing its energy production and integration, as well as its production processes. Thus, all low hanging fruit has been harvested already! Over the past few decades, we have shifted our fuel demand from coal to natural gas. We have established highly efficient combined heat and power plants around the world, and we have significantly reduced our nitrous oxide emissions.

If we compare the BASF Group's CO_2 emissions in 2018 and 1990, we have reduced our absolute greenhouse gas emissions by more than 45 percent.

With our new target, we will reduce greenhouse gas emissions by 60 percent by 2030, compared with 1990. This ambition exceeds the European Union's CO_2 reduction target and is more than in line with the Paris Climate Agreement.

To reduce greenhouse gas emissions even further in the future, we are developing and implementing fundamentally new, low-emission production processes. The plan is to pilot the first technologies between now and 2025, and then scale them up between 2025 and 2030. Additional new technologies will follow from 2030 onwards. This is how we want to achieve net zero by 2050.

[Chart 7: No downstream decarbonization without upstream decarbonization]

On this slide, you can see our greenhouse gas emissions in 2018, broken down by the main emitter categories.

Worldwide, the BASF Group emitted 22 million metric tons of CO_2 in 2018. Half of it is from energy production, more or less equally divided between electric power and steam generation. About 9 million metric tons are from our upstream plants. Major emitters are a small number of base chemical plants, the largest being the steam crackers, ammonia and hydrogen plants. Our downstream plants are much less energy intensive and account for only 2 million metric tons.

This split holds true for the chemical industry in general and underlines two key facts: Firstly, the need for a lot of renewable energy to succeed and secondly, the need to reduce upstream emissions to have a relevant impact on entire value chains. In other words: No downstream decarbonization without upstream decarbonization!

[Chart 8: No downstream decarbonization without upstream decarbonization]

On this slide, the technology levers to reduce BASF's CO_2 emissions have been added in green.

CO_2 avoidance potential in electric power and steam production is covered by the "Grey-to-green" and the "Power-to-steam" levers. CO_2 emissions in our upstream and, to a lesser extent, downstream plants are addressed by "New technologies," most of which we are developing as part of our Carbon Management. In addition, "Bio-based feedstocks" will be used seamlessly in our production – partially replacing fossil feedstocks.

"Continuous opex" will be applied at all levels. These operational excellence measures help us to continuously reduce our CO_2 emissions. They have the greatest impact at our Verbund sites.

[Chart 9: Our levers to reduce BASF's CO_2 emissions]

Let's talk about our levers to reduce BASF's CO_2 emissions in detail. They will help us reduce Scope 1 as well as Scope 2 emissions on our journey to net zero emissions by 2050. I would like to emphasize that we will develop these technologies in partnerships. This allows us to accelerate or generate additional value together. We have announced partnerships with Siemens Energy, as well as with SABIC and Linde. Further partnerships will follow.

Let me briefly comment on temporary measures. To bridge the periods until new technologies are implemented, we will also consider external offsetting measures to a limited extent. If we purchase certificates, we will only use high-quality criteria for external compensation measures, like the WWF Gold Standard.

[Chart 10: Photo – The ultimate lever for CO_2 reduction is electrification with renewable energy]

Now let's take a closer look at the lever "Grey-to-green."

Our way forward is electrification. This means that we will need large amounts of renewable energy. The laws of thermodynamics cannot be changed, and we need energy to drive our chemical processes. But we can replace fossil-based power with green power.

Renewable energy from sources like offshore wind parks will be a key lever to achieve our targets.

[Chart 11: Build-up of renewable energy production must be accelerated to meet demand]

You all know what happens when demand outstrips supply. It is the same for all markets, and the energy market is no exception: prices increase.

Taking Germany as an example: Energy from renewable sources is nowhere near able to meet demand until 2050. Demand for renewable energy is increasing sharply due to the electrification of all major industrial sectors, and the chemical industry in particular. Also, e-mobility and heating buildings will contribute to the increase in demand.

This is why we are strongly advocating building additional renewable energy capacities at an accelerated pace. Additional renewable energy capacities at competitive prices are a precondition for a successful energy transformation.

[Chart 12: Offshore wind energy is a cost-competitive technology today and will be even more attractive in the future]

As you can imagine, we have been intensively assessing the different options for sourcing renewable energy: What technologies and power volumes are available at what cost? How will costs develop in the future?

We see great potential in offshore wind energy. This is one of the technologies that can provide industrial-scale volumes at competitive prices.

Offshore wind energy is already a competitive renewable technology today – even non-subsidized offshore wind parks. In many cases, average costs are already lower than for gas-based electricity. And we anticipate further cost reductions for offshore wind farms. These will mainly be driven by technology improvements, increased capacities and longer service life, as well as lower installation and running costs.

At the same time, costs for coal-fired and gas-based power stations will continue to increase due to lower capacity utilization – as a result of fewer running hours – and the increased costs from carbon pricing, or carbon capture and storage.

[Chart 13: To meet our high demand for renewable energy, we will focus on two pillars ensuring additionality]

Let me go into more detail: To meet our high demand for renewable energy, we will focus on two pillars. These will ensure additionality to effectively contribute to CO_2 reduction. We want to build up a diversified portfolio, taking into account costs, flexibility, and availability.

Firstly, we want to cover our renewable energy demand by selectively investing in own renewable power assets. Secondly, we will also purchase green power from third parties. In other words, we will combine “make” and “buy” for green electricity.

Looking at investments in own renewable power assets: We are assessing different potential projects, such as offshore wind parks, which can provide access to significant power volumes. With these investments, we want to secure our long-term supply at or close to producer economics. We have dedicated teams in place that are working hard to make this a success. Next to wind power, we will also explore local solutions such as solar power at BASF sites.

Besides investing in assets, BASF will also purchase green power from third parties. We will continue to conclude special green power contracts, known as power purchase agreements or “PPAs.” They will help us diversify our renewable energy portfolio with a competitive mix of technologies and regions.

For example, we have already signed PPAs for green power at two of our sites in Texas. We recently concluded a 35-megawatt wind power purchase agreement that will bring 25 megawatts of wind power to BASF’s Verbund site in Freeport and 10 megawatts of wind power to our Pasadena site in Texas. This is in addition to another recently announced PPA to supply the Freeport site with 55 megawatts of power from EDF Renewables’ Space City Solar Project. Approximately 70 percent of the power supplied to the Pasadena site and more than 90 percent of the power purchased by the Freeport site will be from renewable resources.

Overall, our make and buy strategy aims to provide us with the required amounts of renewable energy at competitive prices.

[Chart 14: Photo – Capturing the energetic potential of waste heat for steam production]

Let’s now move on to the lever “Power-to-steam.” This is about capturing the energetic potential of waste heat for steam production.

[Chart 15: CO_2-free steam production in the BASF Verbund with heat pump technology at unprecedented scale]

In Ludwigshafen alone, we release waste heat of up to 30 terawatt hours per year into the air or the Rhine river. We do not currently reuse this energy below certain temperatures. Instead, we cool and release cooling water into the Rhine river.

A dedicated team analyzed the current situation and developed a concept to gradually replace steam production at our co-generation plants with heat pumps and steam compressors. This is technically possible – and our analyses show that in many cases, the economics are viable.

Redeploying waste heat from our chemical plants using electric heat pumps on a scale never seen before – this is something we want to realize together with Siemens Energy, first at our Ludwigshafen site and then globally.

[Chart 16: Competitive green energy in Tarragona enabled value-adding replacement of steam turbine with an eDrive]

Let me make this more tangible with a project that has already been implemented at our Tarragona site in Spain.

In 2018, we replaced a steam turbine in our propane dehydrogenation plant with an eDrive. The investment was recovered in less than two years thanks to reduced energy costs. The team in Tarragona managed to reduce CO_2 emissions by 34 kilotons per year. At the same time, production was increased by freed-up cooling capacity.

The key takeaway of this is that some commercially available technologies can be adapted to local needs and opportunities quickly – the right mix makes the difference. There is no “one size fits all.”

[Chart 17: Photo – We focus on scaling up low-emission technologies to industrial levels]

Another important lever is low-emission technologies, which are mainly developed under the umbrella of our Carbon Management.

Let me walk you through the different technologies one by one, once I have outlined where we are starting from.

[Chart 18: Ten base chemical production technologies cause the majority of BASF's CO_2 emissions]

This slide shows that ten base chemical production technologies cause the majority of BASF's CO_2 emissions. The most CO_2-intensive processes are steam cracking as well as ammonia and hydrogen production. You will see how we are addressing the different processes in the following.

[Chart 19: BASF, SABIC and Linde join forces to realize the world's first electrically heated steam cracker furnace]

Let's start by looking at the electrification of steam crackers. The eFurnace project, which we are pursuing together with SABIC and Linde, is addressing the CO_2 emission reduction potential in this process.

In steam crackers, crude oil fractions are heated to 850 degrees Celsius in the presence of steam. At that temperature, carbon chains break into smaller building blocks for our chemical value chains. Today, cracker furnaces are heated with gas and produce about 1 metric ton of CO_2 per metric ton of olefin. In the future, we intend to heat the coils with renewable electricity.

This technology leap will be a milestone on the path to a low-emission chemical industry. We have developed the world's first electrical heating concepts for steam crackers together with our partners. Now we also want to demonstrate the reliability of key components for this type of high-temperature reactor. Investment support and competitive renewable energy prices are needed to be able to drive a timely scale-up and industrial implementation of this technology.

Together with SABIC and Linde, we have applied for grants from the E.U. Innovation Fund and "Decarbonization in Industry," a new program from the German Federal Ministry for the Environment. If funding is granted, a multi-megawatt pilot plant at BASF's Ludwigshafen site could start up as early as 2023.

[Chart 20: The use of hydrogen as a raw material is a key lever for CO_2 emissions reduction across several technologies]

For BASF, the CO_2 emissions reduction potential in ammonia and hydrogen production is roughly the same as for steam cracking. So let's take a look at our progress in this area.

BASF mainly uses hydrogen as a raw material. In total, BASF's global hydrogen demand amounts to around 1 million metric tons per year. We currently produce around 0.5 million metric tons ourselves, the highest share with steam reforming of methane. This process emits around 10 metric tons of CO_2 per metric ton of hydrogen.

[Chart 21: Water electrolysis plant will integrate internally produced green hydrogen into our Verbund]

In a first step, we want to integrate internally produced green hydrogen into our Verbund production in Ludwigshafen. We want to do this by starting up a large water electrolysis plant in 2024. In today's market environment, this is not an economically viable project.

Therefore, we have applied for funding through IPCEI Hydrogen Technologies and Systems. The 90-million-euro investment will increase our green hydrogen capacity by 8,000 metric tons. This capacity will be mainly used as a raw material in the BASF Verbund, although some of the hydrogen will be provided to develop the local hydrogen mobility market.

Water electrolysis is a commercially available technology with the disadvantage that it consumes large amounts of electricity.

[Chart 22: Methane pyrolysis combines low emissions with low energy demand]

This is why we are working on scaling up our methane pyrolysis process.

We regard methane pyrolysis – cleaving natural gas into carbon and hydrogen – as a key technology for CO_2-free hydrogen in the coming decades. The methane pyrolysis process requires less than one fifth of the electrical energy of water electrolysis. We are a leader here with our development and are in the process of starting up our pilot reactor.

Methane pyrolysis is the most cost-effective way to produce CO_2-free hydrogen. Production costs are much closer to steam reforming today than production costs for water electrolysis will likely be for a long time. However, the first commercial methane pyrolysis plants are only projected to start up toward the end of the decade. We will tap into both technologies, taking a first step with a commercial water electrolysis plant.

[Chart 23: Carbon capture storage technology being evaluated at our Antwerp Verbund site]

Let's move on to a very different technology: The port of Antwerp is a world class port and, at the same time, the biggest European chemical cluster. Under the lead of the port authorities, a consortium named Antwerp@C was founded in 2019 to evaluate potential CO_2 infrastructure to capture and store CO_2 at the port.

Having industrial partners work together gives us the opportunity to create the infrastructure to reduce CO_2 emissions on an industrial, cost-efficient scale.

The idea is to have a gathering backbone pipeline throughout the port, a terminal where CO_2 is liquefied for transport by ship, and an export pipeline to Rotterdam. This infrastructure would make it possible to transport CO_2 to offshore sinks, such as depleted gas and oil fields in the North Sea, both by ship and by pipeline. This would be one of the biggest projects of its kind in Europe.

Antwerp@C has applied for, and received, subsidies under the Connecting Europe Facility for the studies. As a founding member of Antwerp@C, BASF is actively looking into ways to capture CO_2 at the Antwerp Verbund site and transport it to an offshore sink. This could easily absorb volumes of more than 1 million metric tons of CO_2 per year. We aim to make a final investment decision in 2022, based on the results of the studies, and based on the public funding granted.

[Chart 24: Decarbonization requires a broad technology portfolio]

As I already mentioned, green electricity is expected to be in short supply, particularly in Europe. So it is important to know which technologies have the biggest savings potential per megawatt hour of electricity used. These are questions we tackle in our Carbon Management.

For example, methane pyrolysis can avoid about 5 times more CO_2 per megawatt hour than water electrolysis. Compared to a standard fuel-fired furnace, an e-furnace can save 0.2 tons of CO_2 per megawatt hour. This metric can be used to prioritize competing options. But it is not our only criterion.

The absolute emissions that can be avoided by a certain technology must also be factored in. Steam crackers typically have large capacities and are big emitters in absolute terms, and they are crucial for the Verbund. This is our motivation for developing an emission-free e-furnace, despite the lower CO_2 reduction potential per megawatt hour compared to other technologies.

Our Carbon Management Program and our Circular Economy Program, which we presented in December 2020 in great detail, enable us to support our customers with tailor-made innovations – all the way to CO_2 neutrality. These innovations drive BASF's sustainable growth.

[Chart 25: Bio-based raw materials can be used as feedstocks, partially replacing fossil feedstocks]

In the following, I will touch on the bio-based materials that can be used as feedstocks in our Verbund, partially replacing fossil feedstocks.

[Chart 26: Entry points for bio-based feedstocks in BASF value chains]

Bio-based feedstocks can contribute by substituting fossil-based feedstocks. This is where the strengths of our Verbund concept come into play. We can use bio-based feedstocks directly at the entry points of our Verbund, replacing naphtha or natural gas. At the same time, process innovations will enable us to phase in bio-based feedstocks – like sugar or vegetable oils – directly into downstream processes, benefiting specific product lines.

The benefits are tangible: For example, heating our steam crackers with bio-methane could be used as a fast-track drop-in solution – only limited by current availability. This would immediately take out a couple of 100 kilotons of CO_2.

[Chart 27: Photo – Continuous improvements that make a difference today]

Continuous improvement is at the core of our culture, optimizing our Verbund with integrated energy concepts or by minimizing the loss of valuable carbon atoms to CO_2, to name just two examples. We will only look at a comparatively small project today; however, the sum of all of these activities provides significant CO_2 reduction potential for the BASF Group.

[Chart 28: Our upstream integration allows large improvements with single measures]

Let me illustrate this with an example from our process digitalization initiative. Installing advanced process control in our nitrous acid plant allows us to basically eliminate the remaining 1 percent of nitrous oxide in the off gas. This is achieved by keeping the decomposition catalyst in its optimum temperature zone. This one single measure alone avoids an additional 145 kilotons of CO_2 equivalents!

This measure is one of more than 1,500 operational excellence measures we are currently pursuing all over the company to reduce CO_2 emissions and improve energy efficiency.

[Chart 29: Agenda – The transformation is underway on our sites]

I will now focus on two very different sites to illustrate how we are integrating some of the technologies I have talked about today.

[Chart 30: New Verbund site in South China – the integrated chemical complex with the lowest projected CO_2 emissions in the world]

We are drawing up detailed engineering plans for our new Verbund site in South China. We are designing it to have the lowest possible CO_2 emissions. According to our projections, the smart Verbund site will emit 50 percent less CO_2 than a state-of-the-art gas-powered petrochemical site. If you compare it with a coal-fired petrochemical site, the CO_2 avoidance potential is significantly higher.

It is important to note that this is only possible at a Verbund site. Only a Verbund site can use the methane generated in the steam cracker as a raw material in other plants. And only a Verbund site can use the steam released by the cracker – freed up as we plan to use eDrives – to replace fossil steam generation.

Purchasing green electricity is a key part of the plan. We are initially assuming 50 percent green power. We applied the grid factor for the remaining power demand in this graph. If we succeed in covering the site's entire electricity demand with green power, the CO_2 reduction potential would be even higher.

[Chart 31: Integrating renewable energy and stabilizing supply at the Schwarzheide site]

Moving on to BASF's Schwarzheide site in the German state of Brandenburg. This production site has what it takes to be a proof of concept for the energy transition at mid-sized chemical sites.

More than 360 megawatts of capacity from renewable energy sources have been installed in and around Schwarzheide, and another 300 megawatts are planned. This means that much more renewable energy is being produced than consumers in the region are using. In some cases, it is actually more than the grid can take.

At the Schwarzheide site, our gas and steam turbine power plant is already being modernized. BASF is investing 73 million euros so that it can generate electricity and steam with an even smaller carbon footprint. Part of the electrical infrastructure upgrade also involves the use of wind and solar power to supply production facilities.

We want to use this pilot project to show that renewable energies can be used on an industrial scale, despite the chemical industry's great need for security of supply. The modernized power plant will be able to optimally absorb fluctuation. And it can be powered up or down in minutes.

BASF is also considering investing in its own solar farm, with more than 20 megawatts to supplement local electricity supply.

Finally, we are fleshing out a plan to test two different battery storage systems. We will pilot the technologies and then roll them out further.

[Chart 32: Agenda – Capex plan and prerequisites]

Let's continue with the necessary investments and other requirements that must be met.

[Chart 33: Major capex for further transformation only expected beyond 2030]

Ladies and Gentlemen,

Over the next 5 years, we will need less than 1 billion euros to develop the low-emission technologies presented today and scale them up in pilot plants. This is already included in our capex budget, which we published in late February 2021. We applied for public funding to study these breakthrough technologies and for pilot projects. We expect politics to make good on its offer to support accelerated implementation of pioneering, new low-emission technologies.

In the following 5-year period, from 2026 to 2030, capital expenditures will increase to around 2 to 3 billion euros. During these years, we plan to bring our first Carbon Management technologies to scale and shift up a gear in our efforts to electrify our energy demand.

From 2030 onward, significantly higher investments are to be expected. These will be required to build world-scale production plants using the new technologies, and to scale up the use of renewable energy. The Verbund site in South China will already be fully operational by the time these higher investments are necessary.

[Chart 34: The transformation requires a supportive legislative and regulatory framework]

An "all-hands-on-deck" approach is mission-critical to successfully navigating the transition toward emission-free chemical manufacturing – particularly in the E.U. While the industry is working on technology deployment, policymakers will have to create a supportive and enabling regulatory framework. This is paramount to maintaining international competitiveness and a level playing field.

Ample renewable electricity at competitive prices is critical for large-scale investments in new manufacturing technologies. Removing policy-induced costs in the form of levies and surcharges remains a top priority, particularly for the German government. Since we do not expect electricity-based technologies to be cost-competitive under current conditions, policymakers need to ramp up funding programs, as well as new policies to bridge the economic gap for cost-sensitive businesses competing in the global marketplace.

This is particularly important in the upcoming ETS reform – a key legislative project of the E.U. that will have a major impact on the competitiveness of the energy-intensive chemical industry. Sufficient infrastructure needs to be developed to allow renewable electricity to flow freely from regions with abundant renewable energy production to industrial consumers. Existing grid bottlenecks, domestic and cross-border, need to be addressed as quickly as possible. Also, governments need to provide more areas for renewable energies and speed up the approval process for electricity generation and transmission.

CO_2-free hydrogen is a critical raw material to make chemical products emission-free. We encourage policymakers to prioritize the use of green hydrogen as a raw material for industrial consumers rather than incentivizing the inefficient use of hydrogen for electricity generation or residential heating. Those sectors have a broad range of alternative technologies, and valuable hydrogen should not be wasted.

[Chart 35: Agenda – Business opportunities through low-carbon products]

Moving on to the last part of today's keynote: business opportunities through low-carbon products.

[Chart 36: We are a key enabler to help our customers decarbonize their value chains]

Ladies and Gentlemen,

With the technology portfolio to reduce BASF's CO_2 emissions presented today, we will be able to offer more and more low-carbon products to our customers. As an integrated company with base chemical production, we are a key enabler in helping our customers decarbonize their value chains.

Let me give you some examples of how we do this.

[Chart 37: Turning Carbon Management into business opportunities]

Many of our customers aim to reduce their carbon footprint. To support them, a new level of transparency is required.

As we have already communicated, we will provide our customers with carbon footprints for all of our 45,000 sales products by the end of 2021. With our proprietary digital solution, we can determine the overall CO_2 emissions for each individual sales product.

The product carbon footprint is reported in terms of metric ton of CO_2 per metric ton of product. It includes all emissions that occur until the product leaves the factory gate, meaning Scope 1, Scope 2 and Scope 3 emissions. BASF's customers have shown huge interest in this increased transparency, offering business opportunities for BASF.

With our innovative solution, we are a front-runner when it comes to additional customer benefits through CO_2 reduction.

[Chart 38: Offering our customers choices to reduce their CO_2 footprint]

We want to give our customers choices. We already offer a toolbox and are continuously expanding this. It includes:

- recycled feedstock through ChemCycling™ technology,
- renewable feedstock under the biomass balance approach,
- renewable energy sources,
- and, last but not least, the necessary transparency on footprints and reduction potentials.

This toolbox enables us to support our customers with sustainable solutions. It allows us to differentiate from competitors. It is clear, however, that incremental, specific CO_2 reductions have their price for customers and consumers.

At the same time, lower-emission products have higher growth rates and will have higher prices. This is why we are convinced that the transformation toward a low-carbon and circular economy will create opportunities for BASF's profitable growth.

[Chart 39: Product Carbon Footprint allows targeted discussions with customers on desired sustainability properties of products]

Here's a specific example from our aroma ingredients business. Key customers in this business are already keenly seeking solutions to reduce CO_2 emissions along the value chain. In addition to our existing portfolio, we have recently started piloting new offerings with lower CO_2 emissions or even using renewable feedstocks through biomass balancing.

It’s too early to comment on the success of these pilots. But we expect the additional value created by lowering CO_2 emissions to become more tangible soon – as the end consumer demands this. As a result, we see opportunities for capturing a return on the required investments for CO_2 reductions.

From the selected levers, different CO_2 emissions reductions can be achieved. We can tailor product properties to match the specific customer need. In this particular example, an overall reduction of up to 85 percent is currently possible.

We are a front-runner with this approach. What is needed, however, is cross-industry standardization on the calculation of the product carbon footprints. And the cost of investing in emission reduction needs to be spread along the value chain.

[Chart 40: What we expect from our suppliers: Transparency on and reduction of CO_2 emissions]

Cross-industry standardization would also help us when dealing with our suppliers. Why is it important to also talk about our suppliers and our procurement activities?

In 2018, BASF emitted around 22 million metric tons of CO_2 per year from its own operations, what are known as Scope 1 and Scope 2 emissions. Another estimated 52 million metric tons of CO_2 came from raw material purchases as Scope 3.

As our customers demand from us a lower product carbon footprint, we also demand from our suppliers certified product carbon footprints for all raw materials we purchase. To support our suppliers and the industry, BASF will share its knowledge on product carbon footprints and strive to create an international standard for CO_2 transparency tools.

We will work together with our suppliers to reduce upstream Scope 3 emissions in parallel with our own efforts.

[Chart 41: Economics of Decarbonization]

Ladies and Gentlemen,

In the end, you – rightfully – want to know what impact decarbonization will have on our bottom line. Markets are transitioning; awareness and transparency around ESG in societies and capital markets, particularly in the E.U., are increasing rapidly. Ultimately, decarbonization will only succeed macroeconomically if consumers accept that they have to pay more for low or zero-carbon consumer products. And this development has become mainstream around the globe.

Initially, this transition will be economically challenging for companies. Ultimately, we expect a positive impact on sales and profitability. Due to rising demand, products with a low carbon footprint will see above-average volume growth and higher prices, compensating for higher production costs. Customers will increasingly be willing to pay higher prices for low-carbon products. We expect higher margins for those products when they are produced at our highly efficient Verbund sites.

Regarding capex and costs, we expect increased capex to be partially mitigated through public funding for pioneering, new technologies. Mass balance approaches in our existing Verbund assets – like the use of green electricity, green hydrogen or bio-based feedstocks – are associated with minor incremental costs.

At the same time, we are fully aware that the external environment will also be decisive. High initial variable costs for renewable energy have to decline, accompanied by increased availability and favorable regulatory changes. A supportive overall regulatory environment will drive positive economics and accelerate the transformation.

We currently find a pragmatic, solution-oriented framework in China and, with the Biden administration, expect this in the United States, too. Whether we will ultimately have an investment-friendly environment in the E.U. as well, translating the European Green Deal into an enabling framework for the chemical industry, remains to be seen.

[Chart 42: BASF's journey to net zero 2050: Key takeaways]

To conclude, Ladies and Gentlemen, let me summarize:

We are a key enabler for the net zero transformation of base chemicals and respective downstream value chains.

Globally, we want to reduce our absolute CO_2 emissions by 25 percent by 2030, compared with 2018.

This means that, compared with 1990, we aim to reduce our global CO_2 emissions by 60 percent by 2030, exceeding the European Union's target – and more than in line with the Paris Climate Agreement.

We aim to achieve net zero emissions at BASF by 2050.

We are a front-runner in offering our customers a portfolio of products with lower carbon footprints to enable their decarbonization.

With that, I would like to thank you for your attention.

And now, Hans and Stefanie will join me on stage, and we are looking forward to your questions.