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Our Way to Zero CO_2

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Executive summary

The 2015 Paris Climate Agreement, a treaty on climate change agreed by over 190 countries, limits the global temperature increase to well below 2 °C and calls for continuing efforts to limit this to 1.5 °C. Industry is one of the largest emission-producing sectors, making it essential for industry to contribute to achieving the Paris accord's reduction targets. Eppendorf has set its goal: We intend to cut our carbon emissions in our own operations down to zero by 2028. Time for an interim report.

Introduction

The Eppendorf corporate purpose is to improve human living conditions. This has never been more relevant than today. Eppendorf targets to contribute to the battle against the climate change. We support scientific work on how to cure serious diseases and to secure food for eight billion people and more in the future. The solutions we need for the future of humanity come from scientists in the laboratory, whom we support with our products and solutions. Climate change is already affecting and threatening the lives of many people around the world. In order to contribute to mitigating climate change, we set ourselves a list of climate targets.

Eppendorf faces up to its responsibility and has clearly anchored the core issue of sustainability within the company's corporate strategy. Corporate responsibility does not just begin and end with producing and selling a product. Instead, the focus is on each step of the entire value chain.

For this reason, our strategic framework includes many topics in the areas of climate change, natural resources, social compliance, human well-being, digitalization, and society – from the raw materials supplier to the customer. To achieve our carbon emission reduction goal, the Eppendorf Sustainability & HSE team has developed a we can implement to significantly reduce our carbon emissions of Eppendorf as a company (Scope 1 + 2 and, in part 3; see also page 3).
Eppendorf's management board declared in summer 2022 a goal: Based on the results of our climate strategy, we want to cut down our carbon emissions in our own operations of Scope 1 and 2 emissions. Our goal is to reach this "zero" by 2028, based on the reference year 2019.

What has happened since then?
Where do we stand today as a company?

Facing reality

Plans are the baseline for any action. But plans are a theoretical approach which then needs to be assigned to reality. As probably everyone realizes who dips into the details of carbon reduction, the more time you spent on the topic, the more aspects, sub-aspects, and sub-sub-aspects appear. Whereas challenges of classic problems quite often get more feasible the nearer you come, climate change aspects are hyper-connected, especially in a globally acting industry with different production sites, numerous suppliers, and strict regulatory aspects of the laboratories.
To cut it short, the closer you come to reality regarding carbon savings, the more challenging the topic becomes.

We stick to our goal to drastically reduce our emissions. The Eppendorf climate strategy developed by our sustainability team is the baseline. The plan bundles measures that reduce CO_2 emissions at Eppendorf production sites and in administration. The implementation has already been underway for several years.

Baseline of all calculation is 2019 as 2020 and 2021 are biased by the high global requests for laboratory material to fight the pandemic. Especially tubes and pipettes tips were produced 24/7 and shipped in extremely high numbers by air-cargo to keep the global laboratory community in working mode.

"We have already successfully moved some levers," explains Enrico Jakobi, Head of Sustainability & HSE. "For example, we have been able to reduce CO_2 emissions at our own sites from 29,000 tons to 17,000 tons since 2019." The 12,000 tons of CO_2 saved are roughly equivalent to the annual emissions of around 1,000 average households.

Table 1: Greenhouse gas (GHG) emission in tCO_2e [1)]

	2022	2021	2020	2019
Total emissions Scope 1 and 2 market-based	8,814	9,099	20,935	20,846
Scope 1 [2)]	7,009	7,193	6,955	7,644
Scope 2 market-based [3)]	1,805	2,023	14,097	13,202
Scope 2 location-based [3)]	8,875	10,149	9,498	13,525
Scope 3				
Category 4 + 9: Up- and downstream transportation	5,757	7,588	6,618	4,290
Category 6: Business travel (flights)	2,256	885	828	3,476
Category 11: Use of sold products [4)]	246,561	232,434	242,422	78,308
CO_2 intensity				
Scope 1 and Scope 2 emissions per Mio € in sales[5)]	0.0071	0.0083	0.0216	0,0259

1) Eppendorf calculates greenhouse gas emissions in accordance with the GHG Protocol, operational control approach. All relevant greenhouse gases are included and converted into tCO_2 equivalents. Carbon accounting includes all Eppendorf locations, with the exception of Eppendorf Himac as this site was not taken over by Eppendorf until 2021. Emissions were modeled and extrapolated for units with fewer than 20 FTEs.
2) BAFA emission factors from the Informationsblatt CO_2-Faktoren (CO_2 factors fact sheet) and the German Federal Environment Agency's Kohlendioxid-Emissionsfaktoren für die deutsche Berichterstattung atmosphärischer Emissionen (carbon dioxide emission factors for German reporting of atmospheric emissions) were used to calculate the sites' Scope 1 emissions. Emission factors from the GHG Protocol (Emission Factors from Cross Sector Tools) were applied for the vehicle fleet. CO_2 emissions for Eppendorf vehicles were corrected retroactively for 2021 and 2020.
3) The various methods used to account for Scope 2 emissions applied different emission factors: market-based emissions relate to the emission factors of the individual electricity supplier. If such factors were not available, the AIB's European Residual Mixes 2020 were applied for locations in Europe, with the EPA eGRID being used for locations in the U.S. The remaining sites were evaluated using the carbon footprint country specific electricity grid greenhouse gas emission factor. Location-based emissions relate to the average emission factors of the power grid in which electricity is consumed. CO_2 emissions for location-based Scope 2 emissions were corrected retroactively for 2021 and 2020.
4) Typical utilization and a life cycle of 10 years per product have been assumed for Eppendorf electronic products. For our bioprocess units, no useful information is available; therefore, they have been omitted from the analysis. The data for 2020 and 2021 were corrected retroactively.
5) CO_2 intensity describes the Scope 1 and Scope 2 emissions divided by net sales in thousands of euros (€).

> https://sustainability-report.eppendorf.com/2022/data-facts/key-sustainability-indicators/

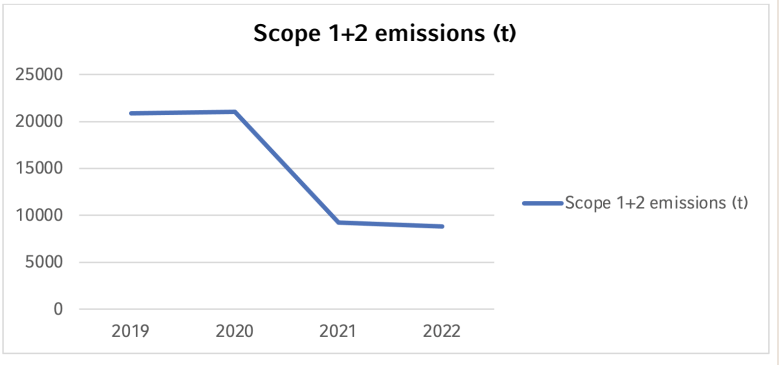


Figure 1A: Scope 1+2 emissions in [t] of Eppendorf since 2019

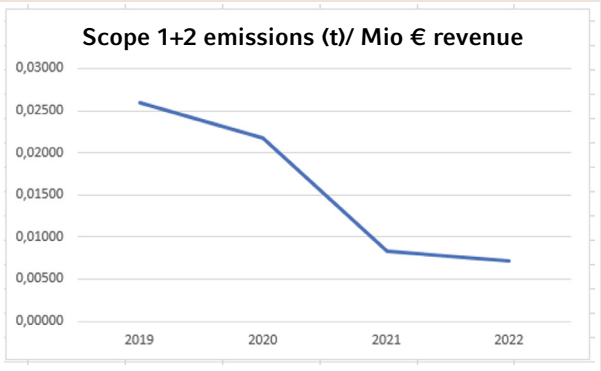


Figure 1B: Scope 1+2 emissions in [t] of Eppendorf since 2019 in relationship to revenue [Mio €]

Reporting

Public reporting of progress is key for a reliable and trustful communication. Therefore, Eppendorf decided to start publishing a sustainability report already in 2022 (about 2021) although the Corporate Sustainability Reporting Directive (CSRD) requires the reporting from 2026 (reporting year 2025) ongoing. Companies subject to the CSRD will report according to European Sustainability Reporting Standards (ESRS).
For our current reports, we stick to the Global Reporting Initiative (GRI) guidelines.
By participating in the UN Global Compact, Eppendorf commits to the pact's 10 principles on human rights, labor, environment, and anticorruption. Before a company may join the UN Global Compact, its management must commit to the ten principles in a Letter of Commitment.
The Eppendorf board signed the company's Letter of Commitment in January 2022. Every year, Eppendorf will document and publish the progress it makes on all its activities.

What is included in our goal?

In contrast to quite some company which promise complete cut-downs of all emissions to zero combined with very long timelines, we decided for a different approach:
We have focused on aspects which are under our own control, that means emissions based on our own operations, combined with a mid-term target timeline.

Scope 1:
Direct GHG emissions refer to emissions from sources that are owned or controlled by the company, like the generation of electricity, heat or steam, transportation of materials, products, employees by company owned vehicles and to fugitive emissions.

Scope 2:
Indirect emissions refer to purchased electricity.

Scope 3:
All other indirect GHG emissions which occur in a company's value chain, like extraction and production of purchased materials, product use, disposal of waste, or employee business travel.

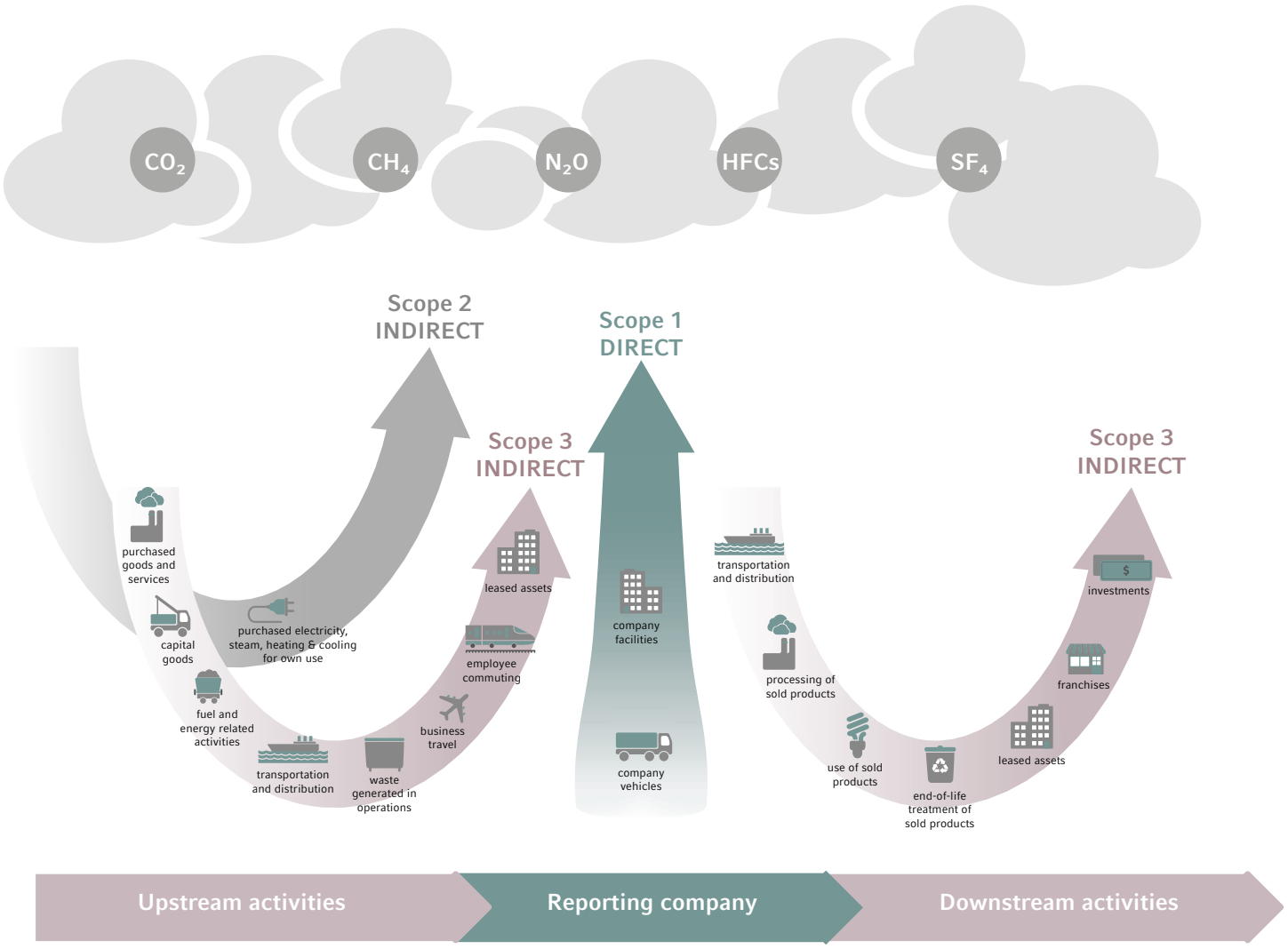


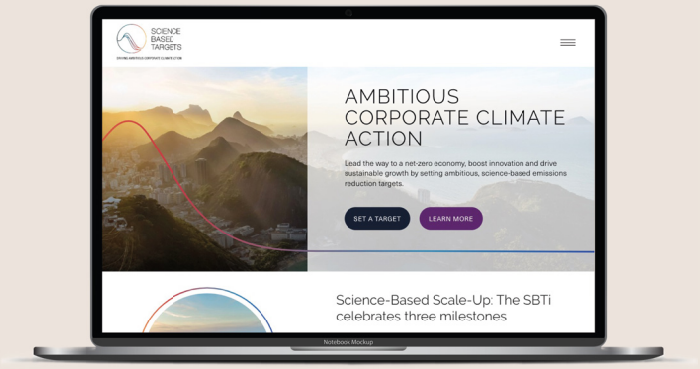
Figure 3: Scope 1, Scope 2 and Scope 3
[32] Adapted based on:
https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporing-Standard_041613_2.pdf

For the time being, the so-called Scope 1 and Scope 2 emissions are considered. These include emissions from fuels in company-owned vehicles, from heating and cooling systems, and from electricity, heat, and steam that Eppendorf purchases from utilities (see also box). The Scope 3 emissions considered are parts of 3.6 (Business travel) and 3.9 (Transport and distribution (downstream)).
For sure, there are requests in the global community to include the complete set of Scope 3 emissions in the industry scoring sheet. This is a fair approach as especially the emissions caused by pre-production steps at suppliers as well as by our products in the laboratories are (estimated) by far the biggest majority of our total emissions. But so far, we can not measure, document, and influence the emissions of our suppliers as well as to control how often our customers use their equipment and which type of power contract they have. In addition, these Scope 3 emissions of Eppendorf are Scope 2 emissions of the user and will appear on their scoring.
So far, we capture the emissions of scope 1 and 2 and publish these data. Within the next years we will also capture more and more emissions of scope 3 to reduce the amount of estimated data within the carbon balance sheet.

Science based approach

As a company, we want to be transparent about which assumptions and methodologies we use to calculate our greenhouse gas inventory.
As a science-driven and science-serving company, science-based targets (in line with the goals of the Paris Agreement) and documentation of emissions are set for us ("science based approach").
It is furthermore important to know that neutralization of scope 3 emissions is optional according to the GHG Protocol Corporate Standard, whereas other standards like the Science Based Target initiative (SBTi) make it mandatory.

In October 2023, we signed the SBTi.



Energy and climate

One major lever to reduce carbon emissions is the right selection of power. Electric power from renewable sources is becoming more and more common. Even the price delta between green power and classic power is getting smaller compared to some years ago. Still, there is quite often a price difference and a pro-active switch is also some financial commitment of a company to more sustainability.
Although the general/ classic power mix is based on an increasing percentage of renewable power, we decided to switch our power contracts to 100% green power. Starting in 2018, the first Eppendorf factory was able to perform product assembly based on 100% renewable power.
In the following years, nearly all our factories as well as the Hamburg-based headquarters followed this path.

There are two small factories which still use classic power mix: A new factory in Shanghai where the switch to renewable power is planned and our Japan-based factory for highspeed and ultra highspeed centrifuges. The centrifuge factory is integrated in a bigger industrial complex where a change of power supply is currently not possible.
In the next steps, the global warehouse but also the local sub-hubs will be adapted to green power.

The switch to renewable energy at the described Eppendorf sites has resulted in a reduction of our Scope 1+2 emissions by 58% (2022 compared to 2019). We see further reduction potential by switching further locations to renewable energy.

Table 2: Eppendorf total energy consumption in MWh GRI 302-1, -3

	2022	2021	2020	2019
Total energy consumption	66,791	66,451	61,781	62,158
Electrical power	33,746	32,301	28,747	26,624
Sourced form renewables energies	30,599	29,155	0	0
Fossil fuels	31,474	32,430	31,388	33,998
District heating and cooling	1,571	1,720	1,646	1,536
Energy intensity				
Energy consumption per € thousand in sales[1)]	0.0541	0.0604	0.0639	0.0773

1) Energy intensity describes the sum of electricity consumption, fossil fuels and district heating divided by net sales in thousands of euros (€).

The **climate standards for new buildings** are uncompromising. Eppendorf is pursuing ambitious goals in Juelich/Germany, where our bioprocess center is expanded. The new building meets the highest quality requirements in accordance with the Platinum Standard of the German Sustainable Building Council. This is currently the best possible domestic seal of approval for sustainable, climate-conscious construction. This is for example based on usage of recycled building materials and the installation of a photovoltaic system that will fully cover the building's energy needs. The new factory in China is to be awarded the internationally recognized LEED Gold certificate for sustainable construction.

Optimizing the energy efficiency of existing buildings is proceeding step by step. Due to the pure number of buildings but also due to the limited availability of material and specialized workers as well as in-time permissions, not all existing buildings will be energy-efficient by 2028. The right framework conditions to implement the missing measures bit by bit is in preparation.
Energy efficiency also includes improvements in capital equipment. For example in the headquarters in Hamburg, the very energy-intensive generation of compressed air was significantly optimized by replacing compressors and improving compressor control in 2022.

Figure 4: Car charging stations at Eppendorf headquarters, Hamburg, Germany

Vehicle fleet and travel
Further emission reductions will come from the complete electrification of the Eppendorf vehicle fleet. Due to the different situations in the dedicated Eppendorf locations globally, this change will happen in every country individually. In global terms, electrification strongly depends on the local charging infrastructure. As being the head office country, all Eppendorf vehicles in Germany will be fully electric by end of 2027. This will include the vehicles of sales & service as well as the vehicle fleet of the management. As of 2023, the ratio of electric cars is already above 20 percent, being a significant impact for the reduction of CO_2 emissions by 43 percent from 2020 to 2022 in our German traffic sector.
Progress in more environmentally friendly business travel is being made by a new travel directive for Germany. For the first time, it takes environmental and climate aspects into account. For example, air travel is only possible from a distance of more than 500 kilometers. Travels by train are to be preferred wherever possible.
In addition, a global travel policy is currently being drawn up that includes the issue of sustainability.

Logistics
Logistic of parts and products have a big impact on emissions. In general, Eppendorf products are shipped by container ships from our central first hub in Germany to our regional distribution sub hubs. By maintaining several global distribution sub hubs, we reduce global drop shipments to a minimum.
Long distance transportation is done by ship and by plane. In 2019, 16% of our products (in terms of weight) were transported by plane. Due to the urgent global request for laboratory equipment during the pandemic, we saw a significant increase in emission levels for airfreight in 2020. We are aiming at significantly reducing the amount of airfreight to below 2019 levels.
In 2022, 24% of pollutants were saved by switching from air to sea freight (compared to 2021). The purchase of a growing amount of more sustainable marine fuels for our containers also reduce the emissions of CO_2 as well as of harmful substances compared to classic heavy oil in marine transportation. A pilot cooperation with DHL GoGreenPlus on the US/Europe transportation track saved more than 40% of CO_2e in Q4/2022 compared to Q3/2022.
Transportation by train is still on a very low level due to time-consuming processing and limited flexibility. We hope that more powerful cargo train systems will be established in the major economical regions in the near future.

Mid- to short-distance transportation is based on trucks. Depending on the region, this can be limited to a single country or cover an economic region like the European Union. Many logistics companies have started to use electric vehicles for transporting lightweight goods in the consumer business. The use of heavy electric trucks and/ or electric long-distance trucks is, however, still in a very early stage. Due to weight and size of many Eppendorf products, special trucks equipped with a lifting ramp are mandatory.
In 2023, we support a pilot of one of our suppliers to use a fuel cell truck to transport parts from a supplier to the Hamburg-based production facilities.

Figure 5: Logistic hub at Eppendorf

Climate projects external
Besides the direct reductions of our own emissions, we also want to support exceptional climate projects at our customers. One very significant activity is the sponsoring of the International Freezer Challenge, organized by My Green Lab® and I2SL.

freezer challenge

Over the last years, a growing number of lab teams competes to improve cold storage conditions (fridges, freezers, ULT freezers) in the lab and to save energy. In 2023, nearly 2,000 lab teams worldwide finalized the challenge, 14,500 t CO_2 savings. The International Freezer Challenge is supported by Eppendorf since 2017.

Figure 6: Eppendorf BikeStop, Hamburg, Germany

Climate projects internal

To support the usage of bikes for commuting, Eppendorf set up a large bike garage directly at the main entrance of the headquarters already more than 15 years ago: Weatherproof, well-illuminated, VC-monitored and comfortable parking spaces for bikes, supported by dressing rooms and showers for those colleagues driving longer distances. The garage was completely renewed in 2021: The BikeStop has now space for up to 300 bikes. Secured access, sensor-controlled light system, charging boxes for more than 60 e-bikes as well as a compact self-service repair station provide optimal conditions to switch from the car to the bike for commuting. Employees in German Eppendorf facilities and offices can benefit from JobRad®, an attractive leasing system for a broad range of different bikes.

Hamburg is our home town. The initiative „Wi mook dat" ("we make it happen") brings together local companies and local social and/ or environmental projects. The aim of the annual action day is to mobilize and sensitize as many Hamburg companies as possible for social and environmental commitment.
With their efforts, the companies support charitable institutions by combining economy with environment.

Eppendorf supports the recultivation of the river Alster. The Alster is a small river which finally ends up in the two big famous lakes in Hamburg downtown. To improve the condition of nature within the city, we –together with other Hamburg-based companies- take action. The concept of „Lebendige Alster" is to enrich the river with natural conditions for animals and plants and to support the biodiversity in this habitat. For some years now, volunteers spend their free time to recultivate these rivers, bringing back life to the cities and improving the water ecosystem. „Lebendige Alster" enforces these volunteers by joining companies and their employees to help. Step by step, rivers like the Alster get back their original look-a-like, supervised and monitored by the German Nature preserve committee.

Outlook

Despite all the measures taken, the given reality somehow limits the company's own CO_2 emission savings. As of today, not all emissions can be completely avoided, e.g. for heating systems. We are examining numerous options for dealing with the remaining emissions.
The current concept includes a remaining amount of CO_2 which can not be eliminated by improvements, new design, more efficient systems or any other currently available technology.
Being aware of the grey area of emission off-sets, we will probably not be able to completely avoid off-setting.
Starting in 2024, we will compensate for the existing gas consumption in our German heating systems. This interim solution will offset more than 1,000 t of CO_2/ year which we currently can not eliminate as the heating of factories and offices is a given due to the climate zones of the building location.

Thanks to our climate strategy and related targeted measures, Eppendorf is prepared for its way to achieving its climate goals. Significant progress has already been made in reducing CO_2 emissions. Nevertheless, in the coming years, we must continue to fight to reduce every ton of CO_2, because the last kilograms are known to be the hardest.

About Eppendorf

Since 1945, the Eppendorf brand has been synonymous with customer-oriented processes and innovative products, such as laboratory devices and consumables for liquid handling, cell handling and sample handling. Today, Eppendorf and its approximately 5,000 employees serve as experts and advisors, using their unique knowledge and experience to support laboratories and research institutions around the world. The foundation of the company's expertise is its focus on its customers. Eppendorf's exchange of ideas with its customers results in comprehensive solutions that in turn become industry standards. Eppendorf will continue on this path in the future, true to the standard set by the company's founders: that of sustainably improving people's living conditions.

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