SCHOTT
glass made of ideas

Climate Neutral 2030

Challenges and approaches for our climate strategy

Contents

Executive Summary

- International specialty glass manufacturer SCHOTT wants to make an active contribution to climate protection and has made its goal to become climate neutral across its production by 2030 a key component of its corporate strategy.
- Pioneering spirit, long-term thinking and responsible action have always been deeply rooted in SCHOTT's DNA. The company is also guided by these principles when it comes to the fight against climate change.
- The ambitious goal is to be achieved with the help of an action plan that focuses on four fields: Technological change, increase in energy efficiency, switch to green electricity and compensation of remaining emissions.
- Because technological change and time present the greatest challenges to success, SCHOTT is focusing particularly on electrification and hydrogen technology.
- The specialty glass industry needs the right political framework conditions and financial support to ensure that the transformation to climate neutral production can succeed.

The company is also leading the way in coping with climate change.

Foreword

Ongoing climate change is one of the greatest challenges of our time. Looking to the future of our planet, it is high time to act. Everyone must take responsibility – politicians, companies and society.

We at SCHOTT are ready to take responsibility. As an energy-intensive specialty glass manufacturer with over 40 production sites worldwide, we want to make an active contribution to climate protection. We made climate neutrality a central part of our corporate strategy in 2020. Through our zero carbon program, we want to become climate neutral in our production by 2030. Our ambitious goal is to become the world's first climate neutral specialty glass manufacturer.

As a foundation company, we've had responsibility for our employees and society has been rooted in our DNA for more than 130 years. Today, we want to live up to our commitment and conviction in climate protection even more so than in the past.

Based on the avoid – reduce – offset principle, we are pursuing a four-part decarbonization action plan: technological transition, increasing energy efficiency, switching to 100 % green electricity, and offsetting any remaining greenhouse gases.

We are convinced that, as an innovation leader, we will provide important new impetus to the specialty glass industry in the years and decades to come.

We have embarked on the arduous journey towards climate neutrality with a clear goal in mind. And while we do not yet know all the possible solutions, we remain steadfast and passionate in our effort to achieve this ambitious goal.

The transformation to a climate neutral company is not only an enormous challenge. We also view it as a great opportunity to secure our future viability. We are convinced that in the long term, only truly-sustainble companies that reconcile economic, ecological and social responsibility will be successful on the market.

This White Paper is intended to provide deeper insights into our motivation and objectives, as well as the challenges and solutions on our way to climate neutrality.

We hope you enjoy reading it.

Mainz (Germany), September 2023

DR. HEINZ KAISER
Member of the Board
of Management

DR. FRANK HEINRICHT
Chairman of the Board
of Management

DR. JENS SCHULTE
Member of the Board
of Management

DR. ANDREA FRENZEL
Member of the Board
of Management

Specialty glass pioneers with social responsibility

Pioneering – responsibly – together. These attributes characterize SCHOTT as a manufacturer of high-tech materials related to specialty glass. Since our company founder Otto Schott became the inventor of specialty glass and the pioneer for an entire industry more than 130 years ago, the **#glasslovers** from SCHOTT have been constantly opening up new markets and applications.

Our product portfolio ranges from CERAN® glass-ceramic cooktop panels to pharmaceutical glass, ultra-thin cover glass for foldable smartphones, substrate materials for semiconductors, microscopic glass structures for diagnostics and giant telescope mirror substrates. SCHOTT's vials, ampoules, syringes, and cartridges made from borosilicate glass are considered the gold standard for pharmaceutical packaging. With its outstanding expertise in the fields of specialty glass, glass ceramics and related materials, the company is a reliable partner for high-tech industries such as healthcare, home appliances and living, consumer electronics, semiconductors and datacom, optics, industry and energy, automotive, astronomy, aviation and aerospace.

KEY FIGURES FOR FISCAL YEAR 2022

- Global sales of EUR **2.8** billion
- **17,200** employees
- Represented in **30** countries

Acting responsibly has always been part of SCHOTT's corporate culture.

Sustainable corporate model

SCHOTT is solely owned by the Carl Zeiss Foundation, one of the oldest foundations in Germany. With statutes written in 1896, the foundation established a unique corporate model for its two companies, ZEISS and SCHOTT. To this day, it is centered on sustainable development and a special responsibility for employees and society as a whole.

While the social issue was at the top of the sustainability agenda in historical times, responsibility for the environment and climate has long since been added. Environmental protection has been an officially declared company goal since 1987, and targeted measures were taken well before then. SCHOTT continues to set standards in the glass industry through the use of state-of-the-art technologies and by making continuous process improvements. This includes among other things measures in energy efficiency and the denitrification and dedusting of melting tank exhaust gases.

With its strategic goal of climate neutrality by 2030, SCHOTT entered a new era in its commitment to the environment and climate.

Find out more here:
Sustainability at SCHOTT

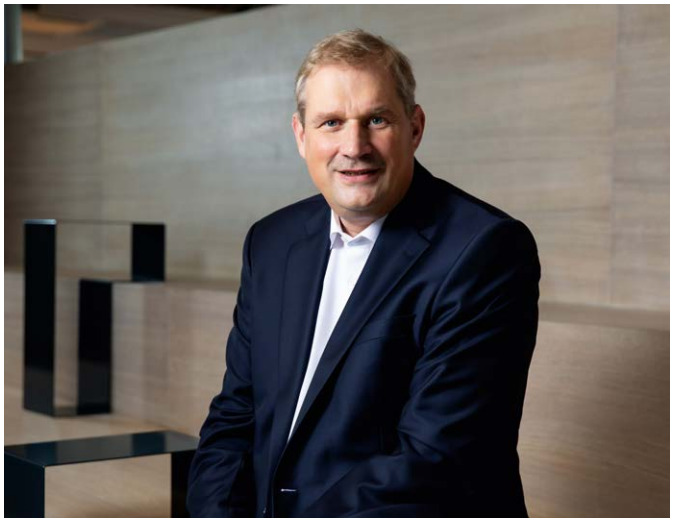
Find out more here:
Environmental and climate protection

The challenge of climate change

Ongoing climate change is one of the greatest challenges of our time. If the global rise in temperature cannot be limited, the livelihoods of more and more people will be at risk. Against this backdrop, around 200 countries pledged in the 2015 Paris Climate Agreement to limit man-made global warming to well below 2 °C. In 2018, the Intergovernmental Panel on Climate Change (IPCC) revealed new findings on the consequences of global warming and underscored the need to limit global warming to a maximum of 1.5 °C compared to pre-industrial times. People are increasingly waking up to the realization that climate change is threatening the very existence of this planet.

Goal: To become the first climate neutral specialty glass manufacturer

Climate change can already be felt in many regions of the world, which is why many countries and companies have made fighting it a top priority. As a globally active company, SCHOTT is also facing up to this responsibility and has set itself a clear goal: climate-neutral specialty glass production by 2030.



In view of the advancing climate change and the future of our planet, we can no longer wait. It is high time to act. Everyone must take responsibility – politicians, companies and society. We are ready to do so. We want to make an active contribution to climate protection.

Dr. Frank Heinricht,
Chairman of the Board of Management of SCHOTT AG

No other company in the specialty glass industry or the glass industry as a whole has ever set such an ambitious goal. With this in mind, the Group has included its climate neutrality goal in its corporate strategy adopted in 2020.

Learn more here:
Press release

SCHOTT receives award for climate concept

The German Energy Agency (dena) has presented SCHOTT with its Energy Efficiency Award 2022 for its strategy program. SCHOTT received the award in the concepts for a climate-neutral future category. The award honours outstanding technological successes and ambitious approaches to transforming the energy system.

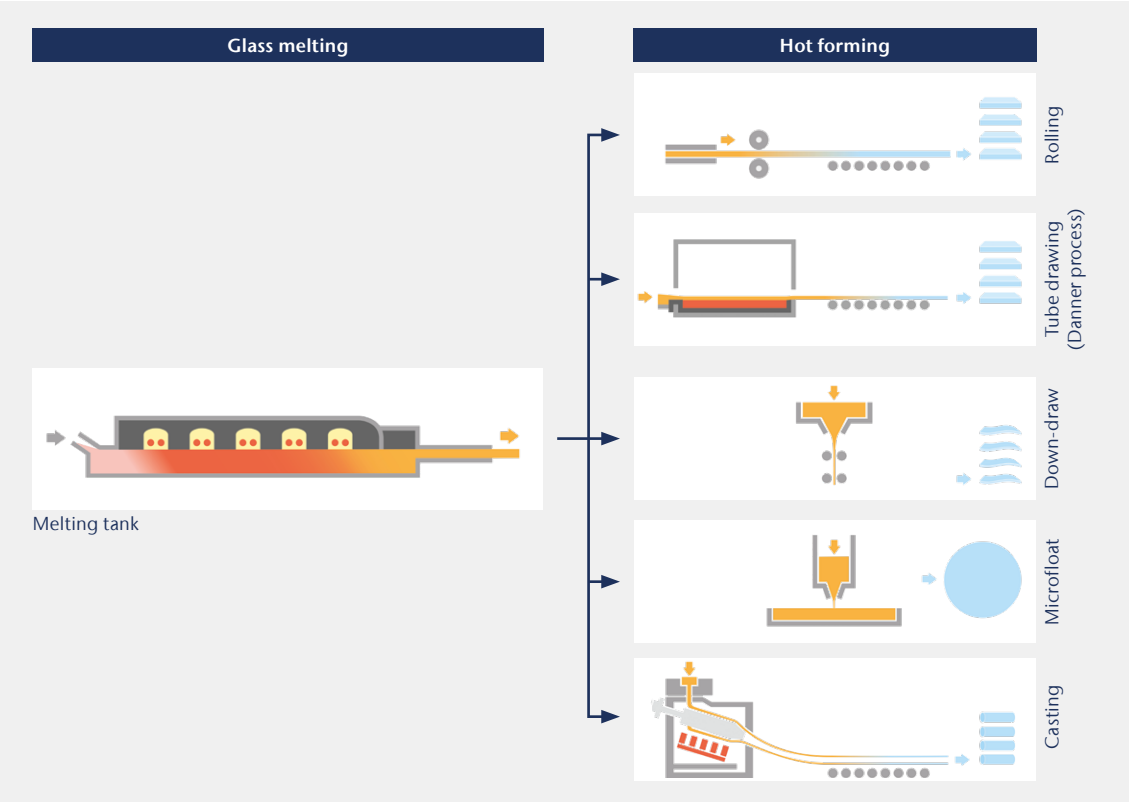
Learn more here:

ENERGY EFFICIENCY AWARD 2022 by dena
GEWINNER
Konzepte für eine klimaneutrale Zukunft

Glass production is energy intensive

As a specialty glass manufacturer, SCHOTT operates in an energy-intensive industrial sector, similar to companies in the cement, lime, steel and chemical industries that are at the beginning of the value chain as basic material or material manufacturers.

Specialty glasses and glass-ceramics are melted at temperatures of up to 1,700 °C in melting units with a daily output ranging from half a ton to 100 tons. The continuous melting process runs 24 hours a day, 365 days a year, with run times of up to ten years.



Energy-intensive core processes at the beginning of glass production: glass melting and hot forming. Specialty glasses are melted at temperatures of up to 1,700 °C.

Besides glass melting, a lot of energy is also required for hot forming and further processing of the glass.

Until now, SCHOTT's melting tanks have mainly been heated using natural gas. In addition, some of the melting plants also have electric heating. In some cases, the melting units have supplementary electric heating in addition to natural gas burners. Smaller units can also be heated exclusively using electricity.

The most common heating technologies for large glass melting tanks are the classic air-fuel technology and the more modern oxy-fuel technology. Air-fuel melting tanks are fired with an air-natural gas mixture, while oxy-fuel tanks are fired with an oxygen-natural gas mixture.

SCHOTT was one of the first companies in the glass industry to introduce oxy-fuel technology on an industrial scale starting in the mid-1990s. It is significantly more efficient than the old air-fuel technology and thus causes considerably lower CO_2 emissions. As a result, SCHOTT has succeeded in reducing the specific energy consumption per ton of glass by more than 30 % with oxy-fuel firing.

HEATING TECHNOLOGIES FOR GLASS MELTING UNITS

Air-fuel: Combustion of natural gas and heating oil with air

Oxy-fuel: Combustion of natural gas and heating oil with oxygen

Hybrid: Combination of oxy-fuel firing with electric auxiliary heating

Electric: Heating exclusively with electricity. Mostly for smaller melting tanks

Carbon Footprint – baseline year 2019: 1 million tons CO_2e*

At the start of the Zero Carbon program, SCHOTT's climate-relevant footprint totaled approximately one million tons of CO_2e (CO_2 equivalents). This is roughly equivalent to the CO_2 emissions of an European city with 150,000 people.

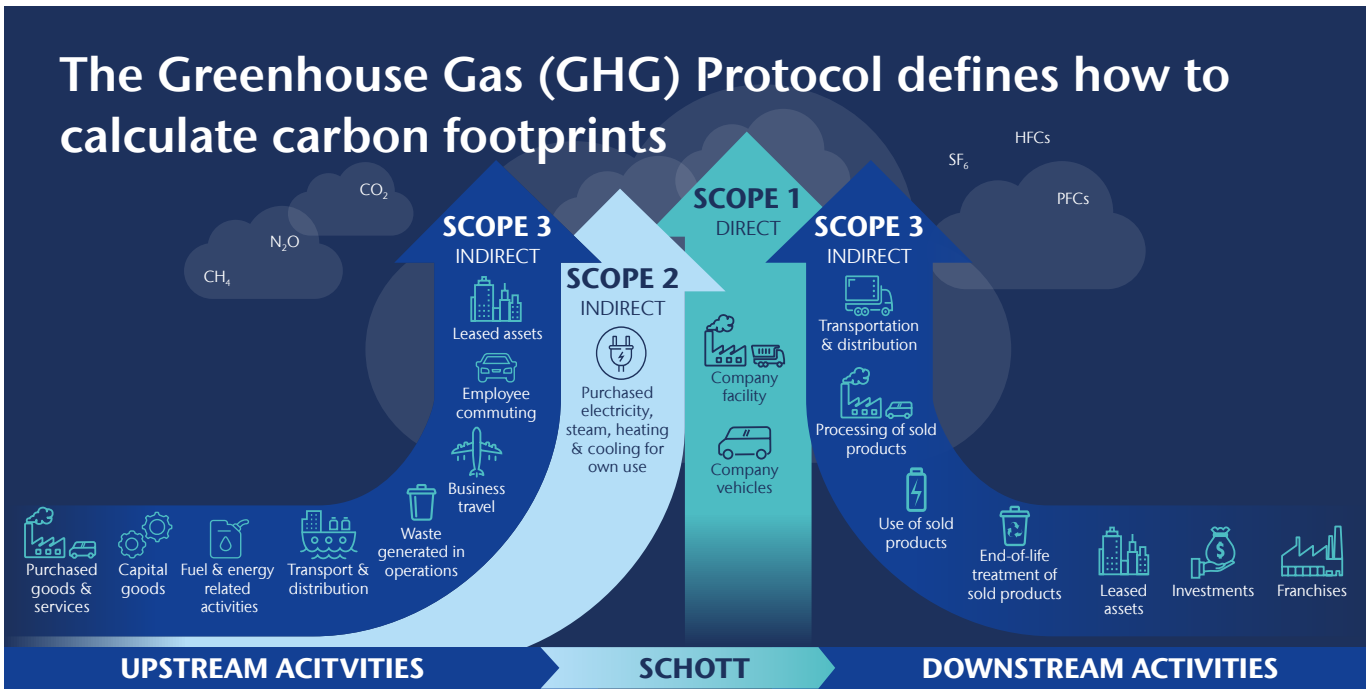
The 2019 calculations result from the market-based method of the Greenhouse Gas Protocol (GHG). The site-specific CO_2 footprint in fiscal year 2019 was approximately 641,000 metric tons of CO_2e.

When collecting data, the company looks at the emissions of all greenhouse gases. CO_2 is the main factor here. The other greenhouse gases, such as methane, nitrous oxide, etc., play hardly any role. In its calculations, SCHOTT currently focuses on the direct emissions from its own production (Scope 1 of the Greenhouse Gas Protocol/GHG Protocol), which primarily result from the combustion of natural gas and heating oil, as well as the indirect emissions associated with the electricity purchased (Scope 2 GHG Protocol). In order to obtain a valid data basis for climate-relevant emissions, the Corporate Carbon Footprint (CCF) has been determined in Scope 1 and Scope 2 since financial year 2019. The CCF's conformity with GHG Protocol requirements has been verified and confirmed by internationally renowned agencies (currently by GUTcert GmbH). In doing so, SCHOTT was able to build on annual reporting on the energy consumption of all production sites worldwide, which has been standardized for years, as well as existing ISO certifications for environmental management systems (ISO 14001) and energy management systems (ISO 50001).

SCHOTT also takes business travel and employee commuting from Scope 3 in addition to Scope 1 and Scope 2 emissions into account when determining the mobility of employees from Scope 3. Initially, the company focuses on the emissions that it can influence itself, but plans to include other Scope 3 emissions from the upstream and downstream supply chain in the next step.

1 million tons of CO_2e

... was the Corporate Carbon Footprint (CCF) at the start of the Zero Carbon strategy program.

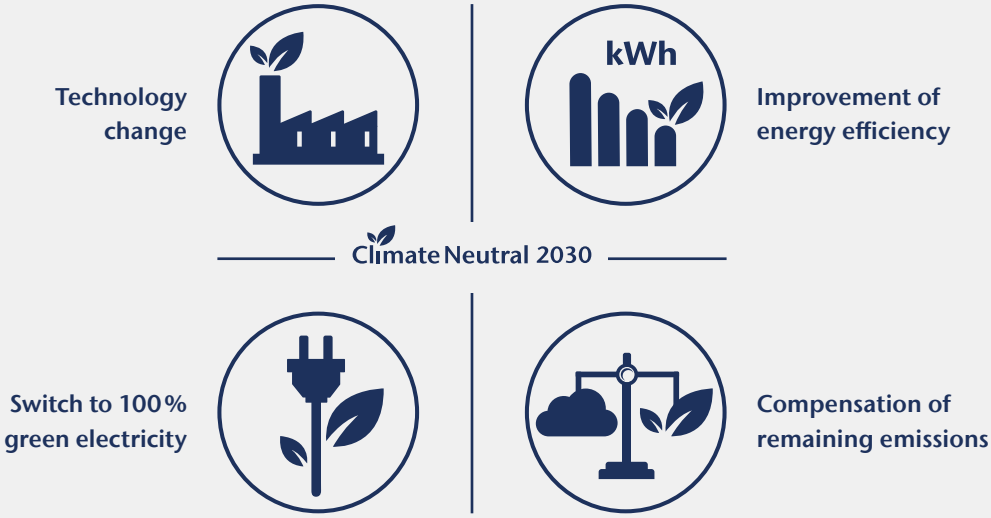


The Greenhouse Gas (GHG) Protocol defines the categories and calculation standards for the climate relevant footprint. SCHOTT initially intends to focus primarily on reducing Scope 1 and Scope 2 emissions.

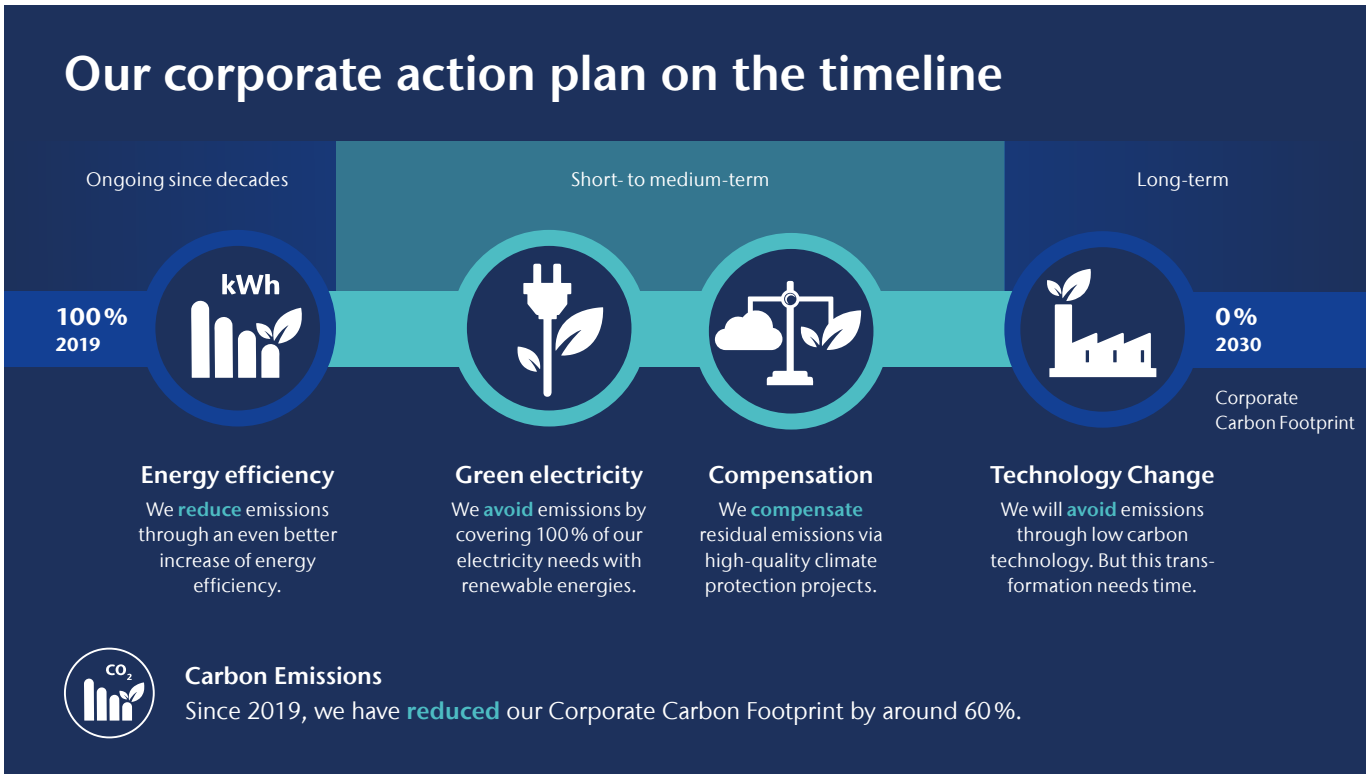
* In order to establish comparability in terms of their climate impact, greenhouse gas emissions are expressed in CO_2 equivalents (CO_2e) according to the GHG Protocol.

Our Action plan

SCHOTT has defined an action plan for decarbonization based on the principle of "Avoid – Reduce – Compensate" that comprises four fields of action:



Viewed on a timeline, short-term successes can be achieved by switching electricity demand to green power and by offsetting remaining emissions. Technological change, on the other hand, is a long-term task. After all, improving energy efficiency has always been an ongoing task at SCHOTT.



Technology change represents the most ambitious change project and will therefore take the longest – even beyond 2030.

Technology change
with a focus on electrification and hydrogen

Around 30 % of the climate damaging emissions at SCHOTT currently come from the company's own production, i. e., they are Scope 1 emissions according to the GHG Protocol. They are primarily caused by the use of natural gas in glass melting, hot forming and further processing. Only a switch to CO_2-free or CO_2-neutral energy sources can remedy this situation.

The goal of climate neutrality requires a massive upheaval in glass production, in some cases with groundbreaking innovations. The development of new melting technologies that no longer rely on the use of fossil fuels takes time, involves a great deal of development and expense, and is dependent on external factors. Therefore, the technological transformation process is the biggest challenge on the way to climate neutrality.

Achieving the goal of climate neutrality requires a massive upheaval in glass production.

In developing new technologies, SCHOTT focuses primarily on the most energy-intensive step of the glass melting process and pursues two transformation paths: electrification and hydrogen technology.

Electrification transformation path

Electrification is about making greater use of electricity, in particular green electricity, to directly heat the melting tanks. SCHOTT has been operating smaller, fully electrically heated melting tanks for decades. For larger melting tanks, the company has been using hybrid technology since the 1990s, i. e., the combination of fossil oxy-fuel firing, sometimes with electric auxiliary heating. In the future, the task will be to develop technologies that gradually increase the heating share of electricity, ideally up to fully electrically heated large-volume melting tanks based on electricity from renewable energy sources.

SCHOTT is researching how specialty glass can be melted using green electricity.

Since the end of 2021, two development projects for the company's electric transformation have been supported by grants totaling EUR 4.5 million from the German Federal Environment Ministry. This grant funding comes from Germany's Decarbonisation of Industry program.

The **PLANET 1** project is about industrial research into the complex interactions in the melting process for special-purpose glasses for technical applications when the share of electric heating is increased to over 60 %.

In the **PROSPECT** project, a concept is being developed for a glass melting process for pharmaceutical tubular glass in which the melting units are heated almost entirely with electricity instead of the fossil energy source natural gas.

Both new technologies will use exclusively green electricity in order to greatly reduce carbon emissions. The development work is scheduled so that the first pilot plants will begin operating in 2025.

Transformation path for hydrogen technology

Hydrogen technology is about using hydrogen as a fuel to heat the glass melting tanks instead of natural gas. Here, SCHOTT is focusing on "green" hydrogen, i. e., hydrogen that is produced with the help of electrolysis and electricity from renewable energy sources.

Similar to electrification, graduated solutions are also conceivable here. One option is the admixture of hydrogen to the hitherto dominant fuel, natural gas. The other option is the exclusive use of hydrogen as a fuel. Initial melting tests on a laboratory scale have shown promising results.

Find out more here:
Press releases on technological transition research projects.

- **Hydrogen**
- **Green electricity**

SCHOTT has started a pilot project at its plant in Mainz to test the large-scale use of hydrogen in glass production for the first time. For this purpose, natural gas is gradually being replaced by hydrogen. Over the course of a month, the proportion of hydrogen in the natural gas-hydrogen mixture will be gradually increased to up to 35 % by volume in three test phases lasting ten days each. The large-scale test is a pioneering work for the glass industry. The aim of the experiments is to learn more about the effects of using hydrogen on glass melting processes in order to greatly reduce carbon emissions in the long term. The costs for the experiment amount to more than 714,000 EUR.

In the first large-scale tests, experts are investigating the use of hydrogen in glass production.

Although the technologies for producing hydrogen are not new, little experience has been gained so far in its large-scale use. SCHOTT therefore still sees major obstacles in implementing hydrogen technology. Currently, hydrogen is still a niche product that is mainly used as a basic and process material in the chemical and petrochemical industries. There is also still no large-scale industrial hydrogen production and no nationwide supply infrastructure.

In addition to the lack of availability and supply infrastructure, the price is currently still far too high. As long as these problems are not solved, large-scale use of hydrogen technology is inconceivable. It is therefore important that the German government and European Union support the development of hydrogen technology.

Within the National Hydrogen Strategy framework, a comprehensive set of measures will be developed, for instance feasibility studies on technologies, production, storage, infrastructure and logistics. In addition, the company will draw up a list of potential economically-suitable locations around the world for a future green hydrogen economy. On this basis, the German government intends to support the market ramp-up with subsidies. With its hydrogen strategy, the European Union also wants to establish an internationally competitive hydrogen industry by 2030.

Alternative: Hydrocarbons transformation path

In addition to the two main technologies of electrification and hydrogen, SCHOTT is examining a third solution involving the use of synthetic or biogenic hydrocarbons as an energy carrier. For example, methane produced with the help of green electricity and CO_2, or biogas produced by methanization, or biogas whose heating value can be increased by methanization. The extent to which liquid biofuels can be used directly is also being investigated.

HYDROGEN AS AN ENERGY CARRIER – GRAY, BLUE OR GREEN??

Gray hydrogen
Produced by using natural gas via the process technology route of steam reforming. This produces climate damaging CO_2, which is released unused into the atmosphere.

Blue hydrogen
This is gray hydrogen, where the CO_2 is not released into the atmosphere, but captured and stored (Carbon Capture and Storage/CCS). It is therefore considered climate neutral.

Green hydrogen
It is generated using only electricity from renewable energy sources and water via the electrochemical process of electrolysis and is therefore carbon-free. SCHOTT relies on green hydrogen.

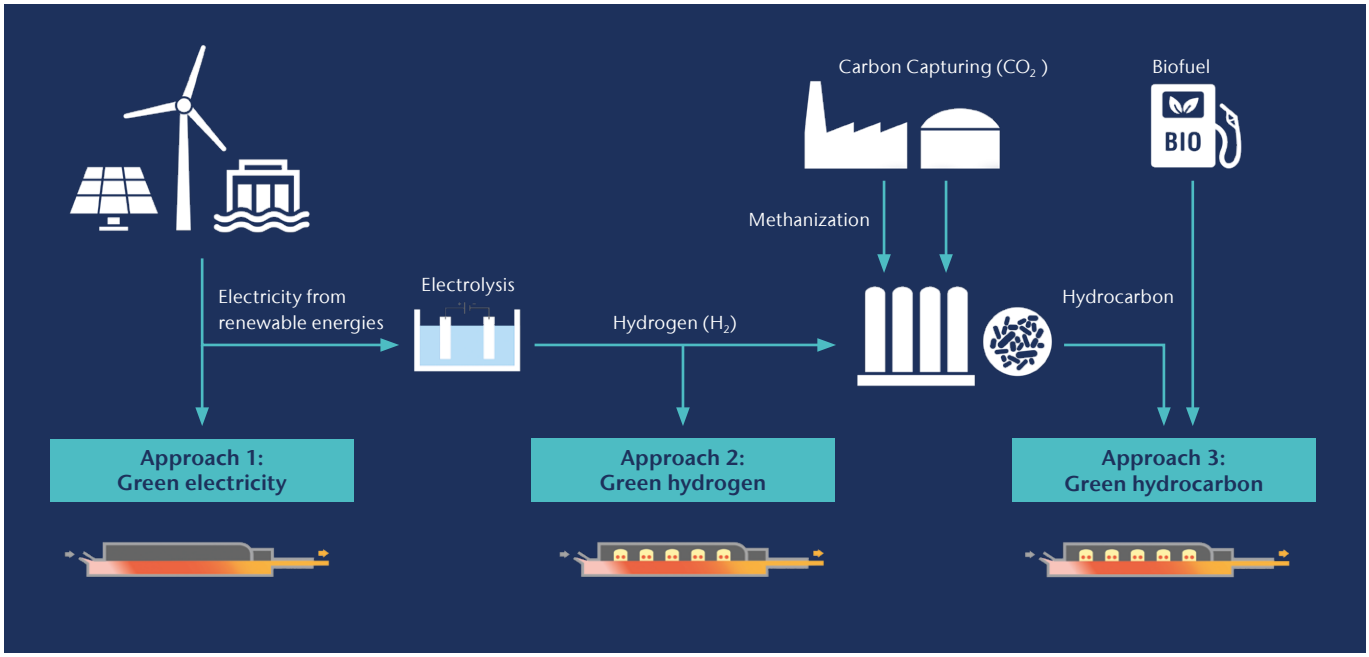
Complex technological challenges

Glass melting is a highly complex and sensitive process. Different glass properties and qualities require different raw material compositions, melting aggregates, melting methods and forming processes. Different interactions must also be taken into account within the melting technologies currently available. Therefore, depending on the type of glass and product, different scenarios for CO_2-neutral or CO_2-free production must be developed with solutions that fit exactly in each case.

Due to the complex interrelationships, the development of new technologies is associated with elaborate process simulations as well as considerable risks and uncertainties with regard to the production process, product quality and the necessary financial expenditure.

Dependent on renewable energy sources

In addition to these complex internal technological challenges, external factors also play an important role. The focus here is on electricity from renewable energies, which forms the basis for all three technology paths.

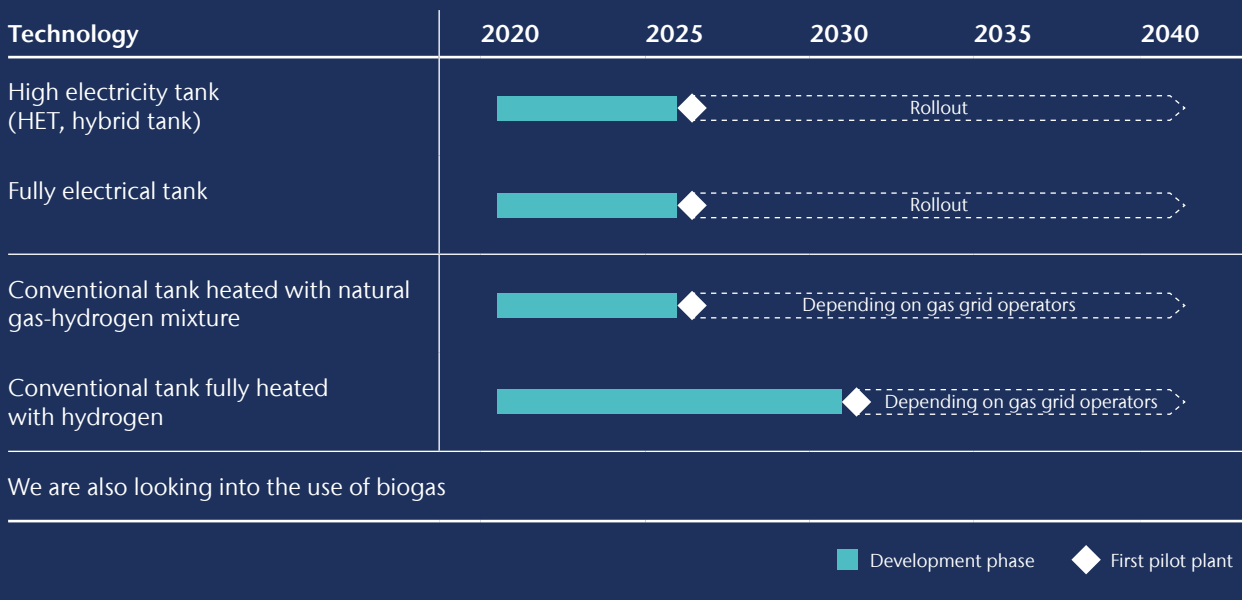


SCHOTT is pursuing three approaches to technological change. Electricity from renewable energy sources forms the starting point for them all. The most efficient is the direct use of green electricity. In comparison, the overall efficiency of hydrogen and hydrocarbons decreases because some of the electrical energy originally present is lost during their production.

A key problem is that the availability of green power is currently limited and the costs are significantly higher than those of natural gas. Therefore, renewable electricity capacity must be expanded significantly and availability must be assured at competitive prices.

The technology shift and energy turnaround in the glass industry therefore largely depend on developments in the energy sector.

Our technology roadmap towards climate neutrality



Technology roadmaps show how a technological transformation of melting tanks is possible.

After researching and developing new technologies, the next big task for SCHOTT is the widespread implementation of sustainable technologies. Here, SCHOTT is doing its planning with the help of technology roadmaps. They show how research results can be implemented in production over the long term. The roadmaps cover all parts of the Group: from the corporate level to the individual business units to all production sites worldwide. The roadmap envisions SCHOTT's first pilot plants for decarbonized production starting as early as 2025. However, the Group-wide rollout of these new technologies depends on numerous factors. In addition to the level of maturity of the technological solutions, the company also needs to take the lifetimes of the glass melting tanks and investment cycles as well as the required investment costs into account.

Whatever viable technological solutions SCHOTT will find, immense development and investment costs are required for a sustainable technological transition.

The experts at SCHOTT do not expect to see the widespread use of new, climate friendly technologies for at least 20 years.

We are convinced that, as an innovation leader, we will provide important new impetus to the specialty glass industry in terms of technological change in the coming years and decades.

Dr. Jens Schulte, member of the Board of Management, responsible for the Zero Carbon strategy project.

Improving energy efficiency

SCHOTT has been focusing on the continuous improvement of energy efficiency and the associated reduction of energy consumption for decades. Due to the high cost of energy, this has always been an important ongoing issue from a business management perspective alone. Based on the principle of “Efficiency First”, SCHOTT is constantly working on identifying and utilizing energy efficiency potential. Due to the permanent optimization of processes, however, the company is increasingly reaching the limits of what is feasible with the technologies currently in use.

Replacing the melting tanks still in operation that use air-fuel technology with melting units that use the more energy-efficient oxy-fuel technology offers some potential for improving energy efficiency, as long as no large-scale solutions are available that work without the use of fossil fuels. However, this is only possible at melting sites that have a stable power supply. After all, oxy-fuel technology requires large quantities of oxygen, and the large-scale production of oxygen requires on-site air separation units, which can only function smoothly if the power supply is stable.

Regardless of this, energy and melting experts are working intensively within the framework of the proven energy management system to leverage further energy-saving potential. The focus here is on various starting points: preheating the raw material mix, more efficient burners, reducing heat losses, utilizing waste heat, and increasing the yield per unit of energy by further optimizing quality control and thus reducing the reject rate.

Increasing efficiency through digitalization

The digitalization of the melting process and artificial intelligence also come into play when it comes to increasing efficiency. Thanks to new sensors and technologies from the field of Big Data, mass data recorded at the melting tanks can be better structured, analyzed automatically and used to achieve process improvements. Process engineers and technicians can thus recognize the complex interactions more quickly and intervene in a more targeted manner, if necessary. This will lead to an improvement in process stability and a higher yield – in short, to a further increase in efficiency.

Artificial intelligence can be used to make the melting process more efficient.

100 %
green electricity

Technology change is a long-term goal that, like running a marathon, requires staying power. The situation is different when it comes to indirect Scope 2 emissions, i. e., the CO_2 emissions associated with the electricity purchased.

At the start of the Zero Carbon program in 2020, SCHOTT set the goal to switch to electricity from renewable sources as quickly as possible. In fiscal year 2020 we took a major step towards this goal by achieving a green electricity share of 75 % worldwide. Our initial focus was on the conversion at particularly energy-intensive locations, i. e., primarily the plants where we operate smelting aggregates. We took the next step in fiscal year 2021 and reached an important milestone when we covered 100 % of our global electricity demand for all locations from renewable energy sources.

In the first phase, we switched to green power by purchasing green power certificates. These certificates of origin, known as Energy Attribute Certificates (EACs), or I-RECs (International Renewable Energy Certificates), prove the origin and quantity of electricity produced with renewable energies.

When purchasing EACs, SCHOTT makes sure that they meet two criteria. First, that the certificates – as far as possible – come from electricity generation plants in the countries that the company actually consumes the electricity in. The situation is different at the consumption site in Germany. As there is too little market supply, the EACs for electricity consumption at these melting sites have so far come from other European countries.

60 %
CO_2 savings achieved

We have been able to significantly reduce our carbon emissions since 2019

SCHOTT covers its worldwide electricity consumption
100 %
with green energy.

The second criterion is the quality of certificates. There are, in fact, different standards for the suppliers as well as the green power certificates themselves. SCHOTT pays very close attention to ensuring that the certificates of origin it purchases guarantee a high standard of quality and make a sustainable contribution to the energy transition.

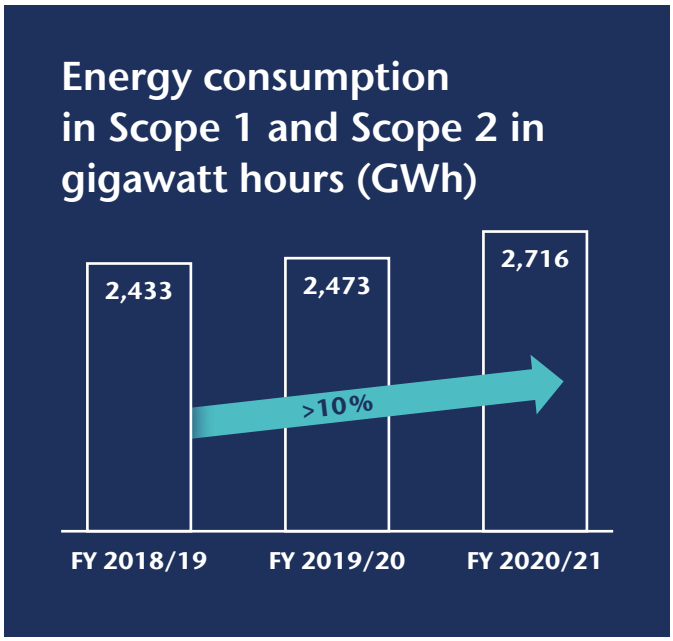
In line with this high quality standard, SCHOTT relies on EACs with the internationally renowned non-profit EKOenergy label or, as in the USA, with the Green-e green electricity label. Both labels guarantee that the operators of the respective plant meet special sustainability criteria.

Power Purchase Agreements since 2022

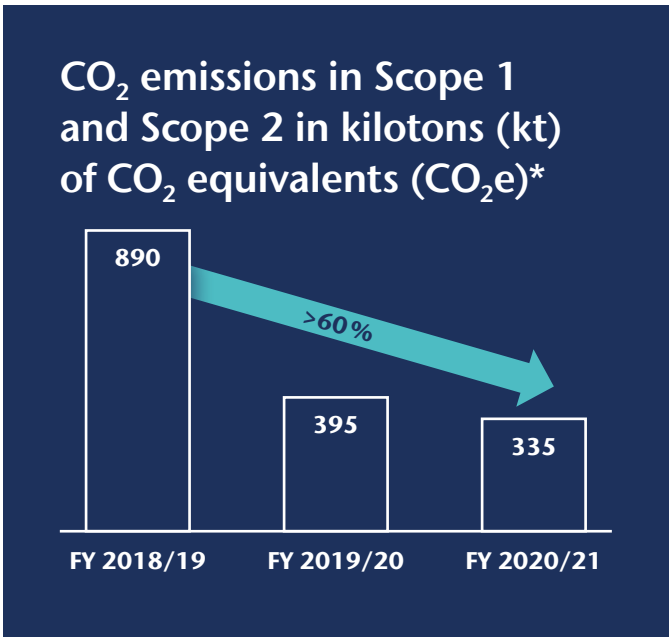
We have also been using Power Purchase Agreements (PPAs), i. e., electricity purchase agreements made directly with operators of renewable energy plants such as onshore wind farms (or with marketers of electricity from such plants) since 2022. Here, too, we focus on quality: through PPAs, we want to support the expansion of renewable energies or help ensure that old plants that are no longer eligible for EEG subsidies in Germany can be maintained and continue to be operated in a sensible manner.

CO_2 emissions reduced by 60 %

Primarily due to the switch to 100 % green power, we have already been able to reduce our climate-damaging emissions by more than 60 % since 2019 – despite an increase in energy consumption due to the high capacity utilization of our current and the commissioning of new production facilities.



We require a lot of energy for glass production, primarily electricity and natural gas. Due to the commissioning of new production facilities, our energy consumption increased by over 10 % from 2019 to 2021.



From 2019 to 2021, we were able to reduce our Corporate Carbon Footprint (CCF) from our own production and energy purchased by more than 60 %.

This means that, within two years, a major lever for reducing greenhouse gases has already been successfully implemented. Considering the low hanging fruit has been harvested, however, further reduction in emissions will longer, as it will have to be achieved primarily by continuously improving energy efficiency – or by the difficult and lengthy technological transformation of the melting tanks. Here we are working hard to first avoid and then reduce emissions – and only compensate for them as a final step.

* Calculations based on the market-based method of the Greenhouse Gas (GHG) Protocol. The location-based carbon footprint was 641 kt CO_2e in FY 2019, 620 kt CO_2e in FY 2020, and 671 kt CO_2e in FY FY 2021 671 kt CO_2e. The carbon footprint was reviewed by independent consultants in FY 2019 and FY 2020 for compliance with the GHG Protocol. The FY 2021 carbon footprint was verified with reasonable assurance by the certification company GUTcert. The verification was conducted in accordance with the requirements of ISO 14064-3 and certifies compliance with the requirements of the GHG Protocol.

Compensating remaining emissions

We intend to compensate remaining emissions that we were unable to avoid through a technological transition, energy efficiency improvements, and the exclusive use of green electricity. We are aware that offsetting is only the third best and last solution to become a more climate friendly company. As we are a manufacturing company, we will not be able to avoid all emissions despite our efforts.

Therefore, for the foreseeable future, we will offset climate-damaging emissions by engaging in climate protection projects. Our goal is to gradually increase the volume of offsetting so that we fully compensate for remaining emissions in 2030.

We compensate through certificates from climate protection projects with a focus on nature-based solutions (NbS). These result primarily from projects in countries where SCHOTT operates production sites.

Strict selection criteria and high quality standards
When selecting compensation projects, the company is guided by clear criteria and minimum requirements. Additional aspects of environmental and social sustainability are also taken into account, such as biodiversity or the projects' direct support for the local population. This creates a link with the Sustainable Development Goals (SDG) of the United Nations.

SCHOTT focusses on compensation projects that are certified according to strict, internationally recognised standards.

Finally, to ensure compliance with its defined criteria and the associated high quality, SCHOTT makes sure that the compensation projects are certified according to strict, internationally recognised standards. These include the Verified Carbon Standard (VCS) or the Gold Standard, for example.

Cooperation with experienced partners
In developing and further refining its compensation strategy and in chosing its compensation projects, the company works with experienced and independent organizations that continuously take a critical, professional look at each project as well as the overall portfolio.

The company also views its responsibility as broader than just reducing its carbon footprint: in the future, SCHOTT also wants to contribute to raising awareness and educating people about climate change through local and regional activities. It plans to evaluate corresponding opportunities as part of its next steps.

Ideas from employees drive change

On the way to achieving climate neutrality, SCHOTT also wants to get its employees excited about this important strategic goal and convince them to provide active support. For this reason, the company has announced a worldwide ideas competition in which employees or teams can submit suggestions using their personal expertise to avoid or reduce CO_2 emissions. More than 1,400 ideas came together as a result. A total of 650 have already been implemented. We are examining further ideas for their feasibility.

SCHOTT employees collected more than 1,400 ideas on reducing carbon emissions in an internal ideas competition.

SCHOTT is committed to diversity.
Because diversity leads to great ideas.

The glass industry's policy needs

Climate change is a challenge that all stakeholders must face together – business, politics, and society. This complex challenge cannot be addressed alone.

In the glass industry, the process of transitioning towards climate neutrality can only succeed with groundbreaking technological innovations and a high level of development and investment. SCHOTT is prepared to take this difficult path and make significant investments to achieve this goal. At the same time, the company depends on the support of others so that it can operate in an economically sustainable manner over the longer term.

After all, it is also important to ensure the competitiveness of energy-intensive companies facing global competition. When they commit to climate neutrality goals, they are confronted with gigantic challenges and immense additional costs for this technological change.

Such a tour de force can only succeed with the support of policymakers. The current EU emissions trading system must be supplemented without delay to include a targeted mix of instruments comprising incentives, support mechanisms and regulatory law. Companies committed to climate neutral industrial production need reliable framework conditions for this, especially for the success factors that lie outside their sphere of influence. These are the required framework conditions:

- Well-funded research support for the development of new, climate friendly technologies. The glass industry is focusing in particular on the electrification of glass melting tanks, hydrogen technology and the use of hydrocarbons as fuel.
- A massive expansion of renewable energy generation, much stronger and faster than currently planned. This also includes efficient transmission and distribution networks. After all, electricity from renewable sources plays a crucial role in all technological approaches to CO_2-free glass production.
- Promoting the rapid development of industrial production for green hydrogen and the associated supply infrastructure.
- A legal framework that ensures the availability of electricity from renewable energy sources and hydrogen at internationally competitive costs.
- Investment subsidies for the construction of production facilities using new, climate friendly technologies.
- Climate protection contracts to compensate for the additional costs incurred in production through the introduction of new, climate-friendly technologies.

Targeted cooperation between the glass industry and policymakers is imperative in shaping the transformation process in terms of sustainable climate protection, especially because the German and European glass industry is in global competition, in some cases with companies from regions of the world where climate protection has a much lower priority. The companies that want to make their production and value chains more climate friendly need financial incentives and support, as well as longterm planning security.

Outlook

SCHOTT has set itself the clear goal of becoming climate neutral by 2030. This strategic goal fits very well with our special spirit as a foundation company, which is characterized by a pioneering spirit, long-term thinking and responsible action. SCHOTT is ready to assume its share of responsibility and make a contribution to stopping climate change.

We have embarked on the arduous journey towards climate neutrality with a clear goal in mind. However, we do not yet know all the possible solutions. In any case, we are working with great passion to achieve this ambitious goal.

Dr. Jens Schulte,
Member of the Board of Management

If we take a look into the future today, the scenario at SCHOTT in 2030 could look like this: Electricity procurement is now fully converted to green electricity. Measures to increase efficiency continue to contribute to energy savings and reducing CO_2 emissions on a smaller scale year after year. The foundations in research and development for the technology shift have been laid over the past decade and the first glass melting units have already been converted to largely climate neutral production. However, the widespread use of the new technologies will take much longer because the service life of the glass melting tanks and the investment cycles require this time. The remaining greenhouse gas emissions from the company's own production, which SCHOTT will not yet be able to avoid technologically in 2030, will be 100 % compensated for.

The biggest hurdle for technology change in the glass industry is formed by external factors: the sufficient availability of green electricity and green hydrogen at competitive costs. If these conditions can be met, then the glass industry can ideally replace fossil energy sources with green electricity, green hydrogen or bioenergy in the long term and thus completely avoid CO_2 emissions in its own production.

The transformation to a climate neutral company is not only an enormous challenge. We also see it as a great opportunity to secure our future viability. We are convinced that, in the long term, only truly sustainable companies that reconcile economic, ecological and social responsibility will be successful on the market.

Dr. Frank Heinricht,
Chairman of the Board of Management

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