Marabu

MARABU ENVIRONMENTAL REPORT 2025

York Boeder
CEO

MARABU GROUP IS TAKING RESPONSIBILITY AND TAKING ACTION

As a manufacturer of printing inks and paints (Creative Colours) for artists, how do we practice environmental protection on a day-to-day basis? What obstacles do we have to overcome, and what significance does the increasingly important issue of sustainability have for a mid-size business with global operations?

At Marabu, we have been tackling these questions for a long time. As an ink manufacturer, we are a member of the chemicals industry, and therefore bear significant responsibilities related to the environment and health and safety, both within our company and at our customers' organisations. We have long gone beyond what is mandated by legislation and regulations – this is integral to our company philosophy and embedded within our daily business activities. As a vendor of premium products, we are committed to the further development and reformulation of top-quality inks while conserving resources to the greatest degree possible, across all our business segments.

We regard ourselves as pioneers: by proactively addressing environmental protection, occupational health and safety, resource conservation and sustainability, we have secured a special niche position within the competitive international marketplace. Over recent decades, the Marabu Group has made great progress in terms of environmental management. Key achievements have included systematic waste and recycling management, the installation of a state-of-the-art waste water treatment plant, and the use of "green" electricity. More recently, we have seen our attention turning to new, exciting areas, such as carefully targeted energy management, resource efficiency and conscious efforts to cut our carbon emissions.

By using environmentally friendly materials, energy-saving programs and resource-conserving production methods, we are reducing our impact on the environment and constantly reducing our carbon footprint. As part of our ambitious climate strategy, we have committed to reducing our emissions by a further 20% over the next 10 years.
We are certain to embrace further fresh ideas in the future, prompted by our own conscience and our defined objectives, as well as external influences, such as the UN's 17 Sustainable Development Goals, the EU's Green Deal and regional legislation. We are proud that our proactive approach conserves natural resources and contributes to safeguarding our environment.

We hope the readers of this fourth environmental report find it an interesting and informative read.

Yours sincerely,

York Boeder
CEO

MARABU PRODUCTS

Screen Printing Inks Pad Printing Inks

Digital Printing Inks

Liquid Coatings

Creative Colours

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MARABU HAS STOOD FOR HIGH-QUALITY MADE-IN-GERMANY INKS FOR OVER 160 YEARS

Our long-term, sustainable approach to business and our global competitiveness ensure the success of our multinational company.

Marabu offers premium-quality, user-friendly products across all business units. We are a leader in both inks for specialist printing processes and paints for crafts and hobbies. With 526 employees worldwide and a range of more than 20,000 products, we generate annual sales of over €130 million. Since April 2021, the Marabu Group has been a wholly owned subsidiary of Teikoku Printing Inks Mfg., Ltd., Tokyo, that also posts annual sales revenues of approximately 100 million euros, primarily with screen-printing inks.

As an ink manufacturer, our decision-makers addressed ecological issues at a very early stage. A look at our company's history reveals, for instance, that we had to comply with regulations imposed by government agencies as early as 1888.

Our green milestones:

Carl Albert Martz opened a paint and materials business in Stuttgart in 1859, with a portfolio of high-quality paints and inks. In addition to trading in these products, he was interested in their in-house development and production. In 1888, Albert Martz Junior assumed responsibility for the business and, on the eve of the 20th century, introduced new items, including watercolours and pastels for artists. The construction of a new building brought in new regulatory requirements regarding waste water – which had to be directed to a special mud collector and not simply discharged onto an unpaved city pathway.

In 1919, the company relocated to its current site in Tamm, allowing further growth. Here, the enterprise made a casein emulsion paint, known as Tamma, and oil paints. Again, strict regulatory requirements were imposed to protect water resources, and energy supply issues needed to be addressed. At the time, the company had to secure its own power. Until 1940, electricity was generated by a portable engine fuelled

Beginning of production of low-hazard LIBRA line

1985

Production of first UV-curable inks, 100% solvent-free

1987

Establishment of waste and recycling management

1990

Introduction of packaging returns system

1991

Discontinuation of heavy-metal pigments

1994

Tamm certified to ISO 9001

1995

Elimination of NVPs from UV inks

1997

2007

Electricity supply converted to carbon-neutral renewables (Bietigheim and Tamm)

2008

Ultra Glass UVGCC (cradle-to-cradle ink for glass)

2009

Updated company car policy, definition of low-carbon-emission reference vehicle

2010

Publication of first environmental report

2011

Development of UV inks for LED UV dryers

Responsible Care Award

Responsible Care®
OUR COMMITMENT TO SUSTAINABILITY

2012

Tamm and Bietigheim certified to OHSAS 18001

Maqua® *Jet* – water-based digital printing ink

Tampatex TPX – OEKO-TEX® Standard 100 certification

New online management handbook and global guide

FSC certification for Bietigheim-Bissingen

2013

Knowing your origins is the foundation – knowing your destination is the spur!

by coal. Later, Marabu extended production to drawing implements, which created a high volume of wood waste. As a result, Dr Eduard Martz, the head of the company and the third generation of the founding family, converted electricity generation to wood gas. This remained the source behind the power supply until 1953.

1952 marked the beginning of the era of screen-printing inks: in 1961, manufacture of the MARAPID ink range was modified to make use of non-hazardous solvents, without compromising product attributes. 1985 saw the launch of the non-hazardous LIBRA product portfolio, followed by the first 100% solvent-free UV-curable screen-printing inks in 1985. In 2008, Marabu cooperated with the EPEA, an international research and consulting institute, to present UVGCC, a 100% biodegradable ink for glass substrates, designed around the cradle-to-cradle principle. In 2012, the company unveiled Maqua® *Jet*, a water-based ink for digital printing methods, and pad printing ink Tampa® *Tex* TPX (which received certification to the OEKO-Tex® Standard 100 in 2013).

We are also committed to safeguarding the health and safety of users of our paints and inks for professional and amateur artists. 80% of our Creative Colours are water-based, and for children we offer two products for finger painting and handicrafts that comply with the EU Toy Safety Directive.

The product offering has been expanded over the years, and there has been an increase in the volume of manufacturing and storage needs, leading to growing demand for space.

Despite new buildings and extensions in Tamm, the site reached its limits. To resolve the issue, Marabu constructed a state-of-the-art building in Bietigheim-Bissingen, three kilometres away, in 2004. Today, it houses our Creative Colours operations.

Our long-established efforts to improve environmental protection and safeguard employee health and safety have garnered many prizes and awards. We have, for instance, received the SGIA Award on multiple occasions, and the Responsible Care Award from the European chemicals industry.

1998

Incineration of exhaust-air solvents with heat recovery

ISO 9001 certification for France

ISO 9001, ISO 14001 certification for USA

ISO 9001, ISO 14001 certification for China

2000

Upgrade to underground solvent tank

2014

ISO 9001, ISO 14001 certification for Sweden

ISO 9001, ISO 14001 certification for Brazil

SGIA – Sustainability Recognition Award

2003

SONY Green Partner

Tamm certified to ISO 14001

2015

First CDP CO_2 report submitted

First energy audit at Tamm plant and Bietigheim-Bissingen plant (5 Dec)

2004

New state-of-the-art production facility in Bietigheim-Bissingen

SGIA Environmental Award

Thermographic survey in Tamm

2016

Step-by-step implementation of energy monitoring system in Tamm

2005

Bietigheim-Bissingen certified to ISO 9001 ISO 14001

2017

OEKO-TEX® certification

2006

Energy-efficiency upgrade of Tamm office building

2023

Commitment to the climate alliance

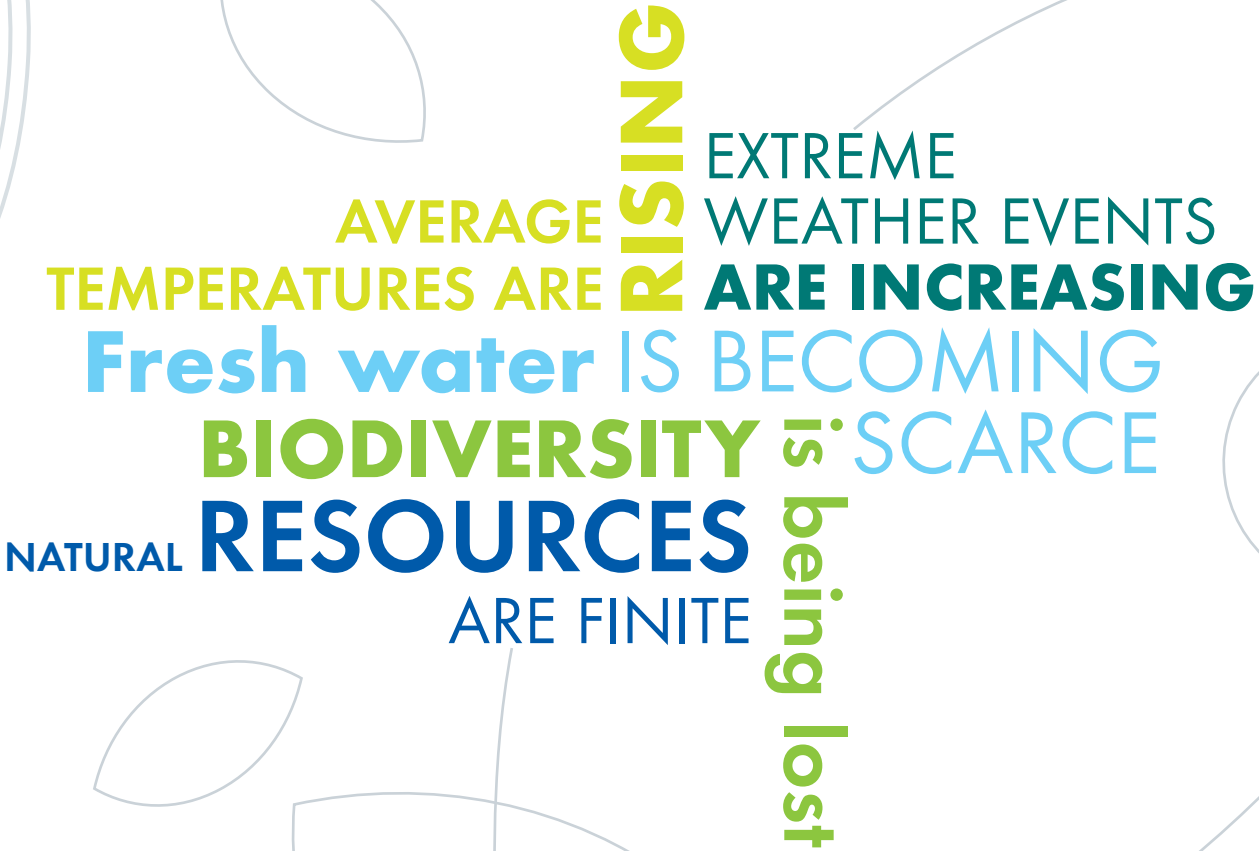
Reduce CO_2 by additional 20% over the next 10 years

ENVIRONMENTAL PROTECTION MEANS TAKING RESPONSIBILITY AND TAKING ACTION

In our everyday lives, we are directly aware of the changes taking place in our global environment. Catastrophic forest fires, floods and droughts all underline that only a transformation in all relevant areas of our western lifestyles and changes to the way we do business can contribute to safeguarding our natural world.

In a history stretching back more than 165 years of company history, Marabu has addressed ecological issues from the very outset. Our unwavering commitment to all aspects of corporate environmental protection, and the development and manufacture of low-emission products, are a solid basis for tackling the challenges that lie ahead.

However, the challenges today are greater than ever before. We must and will convert to a form of business that is fundamentally sustainable in a relatively short space of time. The focus is on reducing greenhouse gases and promoting a circular economy. Marabu is facing up to these tasks, and tackling them in all relevant areas of its business.



MARABU IN THE CONTEXT OF POLITICS AND INDUSTRIAL ASSOCIATIONS

Marabu's ecological objectives are subject to changes over time. They are aligned not just with our own aspirations and our customers' requirements, but also with legislation and the worldwide sustainable development aims of the United Nations. The UN's Agenda 2030 is a sustainability strategy comprising 17 sustainable development goals (SDGs). These are directed at governments, but businesses, too, are expected to contribute to their achievement. Not all 17 SDGs are relevant to Marabu, only a subset. As a member of the VDL (The German Association of the Paint and Printing Ink Industry), we are committed to the five industry aims agreed at the annual general meeting in May 2020.

The five VDL industry aims for sustainable development – our compass

GOAL 3
Health and well-being

To guarantee a healthy life and promote well-being for all people of any age "through the substitution of hazardous materials in paints and printing inks"

Marabu undertook a commitment in 2003 to no longer use input materials that are carcinogenic, mutagenic or reprotoxic (CMR), or categorised as hazard class 1 according to the CLP regulation. For digital printing inks, we will be making greater use of water-based systems that have no VOC1 emissions, and of inks suitable for food packaging. For our Creative Colours, we are developing a product with a large proportion of natural raw materials.

GOAL 4
High-quality education

To guarantee inclusive, equal education opportunities across all disciplines, and to enable lifelong learning "by promoting initial training and ongoing skills development in the paint and printing ink industry"

The recruitment and retention of skilled workers and new, young employees is a key issue for Marabu. Marabu offers young people training in many areas, and maintains close relations with universities and vocational colleges.

Our employees evolve their skills by attending task-specific courses within the scope of an annual training plan. Additionally, for production workers we created the Marabu Academy, with weekly 30–45-minute training modules. Our internal Marabu Academy organises further training measures and online training courses, which also cover topics relating to occupational and legal safety in the environmental sector.

GOAL 9
Innovation and infrastructure

"The promotion of research and development for sustainable products and processes" – to build a stable, eco-friendly infrastructure with space for sustainable innovations in manufacturing technology and formulations

The future belongs to businesses that offer sustainable products made by resource- and energy-efficient means. By developing sustainable products and implementing efficient manufacturing and application processes, we are safeguarding our competitiveness and strengthening Germany's position as an industrial base.

Our products are of high quality, and provide coatings that contribute to the longevity of objects. The use of high-quality inks protects materials against premature wear.

Goal 12
Responsible consumption

To ensure sustainable patterns of consumption and production through "analysis of the ecological footprint of paints and printing inks" across the entire lifecycle

Identifying and reducing the environmental impact of our printing inks and Creative Colours has long been a key aspect of our development work. If you consider a printing ink from its development to its disposal, environmental impacts can be observed at various stages. We assess them in their entirety through lifecycle analysis. When comparing and evaluating types of ink it is important to take a holistic view that considers all factors. Only then can you draw conclusions.

The term "water-based", for instance, implies a high degree of eco-friendliness; at the same time, "vegetable-oil-based systems", on account of their high proportion of renewable raw materials, could be seen in an even more positive light. However, these products require significantly more energy input for the drying process than their alternatives. If you consider the whole picture in full then some products emerge as less eco-friendly than first assumed.

The substrate, too, can have an ecological impact: drying a water-based ink on plastic or metal requires markedly more energy than is the case with materials such as corrugated card.

Considered critically, there is no single print technology or method that is a universally eco-friendly solution. The best solution can only be found when all relevant factors for the specific process and/or product are taken into account during any analysis and subsequent evaluation (cf. wirsindfarbe.de 2022).

By looking at the entire picture, we work with our customers to apply the best possible ink system with the smallest possible ecological footprint.

GOAL 13
Climate protection measures

To take steps to combat climate change and its impact by "increasing energy efficiency in the paint and printing ink industry"

As Marabu has been sourcing electricity from renewable energy sources since 2007, we do not cause any Scope 2 emissions. The challenge for the coming years is to significantly reduce the CO2 share of Scope 1 and Scope 3 emissions. To this end, we have drawn up a road map setting out measures for the next 10 years.

MARABU AND THE EUROPEAN GREEN DEAL

The "European Green Deal" was introduced by the European Commission under Ursula von der Leyen. It foresees reducing greenhouse gas emissions within the EU to zero by 2050, making Europe the world's first climate-neutral continent. The goal is to create a sustainable European Union based on a growth strategy that turns Europe into an advanced, resource-efficient circular economy. Further goals include preventing any further loss in biodiversity and ceasing pollution.

The EU defined 50 policy areas, and plans to implement changes by means of various action plans, e.g. for the circular economy, or the zero pollution action plan of May 2021 that proposes to make air, water and soil free of pollution with the Zero Pollution Vision 2050.

As a maker of printing inks, we will be especially affected by this action plan. Many individual measures have been defined for this purpose. These include, for example: Measures to reduce greenhouse gas emissions, increase the price of fossil fuels, promote a clean, circular economy, combat pollution and much more.

Our Product Safety department is the prime mover of the corresponding discussions and is actively involved in European industrial associations, working towards a Europe that is free from pollution, in line with the EU's plans. When we as a society succeed in this endeavour, and we can play our part, then we do so gladly and with complete conviction.

OUR ENVIRONMENTAL POLICY – GUIDING PRINCIPLES

Our overriding goal is to protect the natural world against harmful impacts on air, water and soil. We believe humanity's most urgent task is to address climate change and its effects. Our "PROJECT GREEN" contributes to reducing atmospheric greenhouse gases. Wherever possible, we make all efforts to support the achievement of the UN's 17 Sustainable Development Goals.

1. Responsibility

Safeguarding human life and the environment is integral to all relevant business processes. We oblige all our employees to comply fully with all relevant duties and policies.

2. Products

We develop state-of-the-art products with low emissions across their entire lifecycle. We prioritise water-based systems and the use of renewable materials.

3. Use of hazardous materials

We choose all our raw materials with the greatest care. Where technically feasible, we avoid the use of hazardous substances that require special safety precautions. Wherever possible, we employ less harmful substitutes that pose much lower health risks.

4. Resource efficiency

Responsible consumption of raw materials and energy-efficient production processes help conserve primary natural resources while improving the cost-efficiency of our business. We focus on the circular economy and believe the use of inks is no obstacle to recycling printed substrates.

Renewable and self-produced energies are favoured. Purchased commercial products made from wood come exclusively from sustainable forestry. CO_2 equivalents (CO_2e) are continuously reduced at all locations.

5. Assessment and improvement

We continuously assess our environmental management practices and outcomes, in terms of opportunities, risks and quantifiable key performance indicators. This enables us to identify potential improvements and initiate corresponding action.

6. Investment

Our investment decisions contribute to achieving our environmental goals. Efficient, state-of-the-art plant and equipment, and advanced IT systems, reduce energy demand.

7. Communications and transparency

We engage in open dialogue, both internally and externally. The knowledge and experience of all employees play a key role in continuous improvement. We promote the training and ongoing skills development of our staff. We take account of the requirements of stakeholder groups and respond transparently. Our commitment to health and safety, and to the environment, is reflected by our active participation in chemical industry associations.

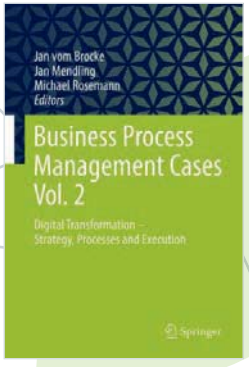
THE PATH TO CERTIFICATION – AN EXEMPLARY APPROACH

The implementation of many legal requirements, directives from regulatory bodies, and voluntary measures across all areas of the business led almost automatically to the initial certification of our main plant in Tamm according to ISO 14001 in 2003. Our self-imposed commitment to continuous improvement of environmental protection means that we constantly critically review our own activities.

Relevant statutory requirements or voluntary internal directives related to the environment are described for the corresponding processes, and are defined more precisely in process and work instructions (company policies). In this way, they are incorporated into our day-to-day operations.

From 2012 onwards, quality management, environmental protection and workplace health and safety requirements have also been applied to core processes of our subsidiaries. Our exemplary approach is of textbook character, and was described in a chapter of "Business Process Management Cases Vol. 2"* published by Springer in 2021, a book that presents real-world case studies.

In 2013, we introduced a directive with global validity, with eleven site-specific versions in the local language. These are online, and therefore accessible to all employees. This guarantees consistently high quality and pioneering environmental protection standards worldwide.

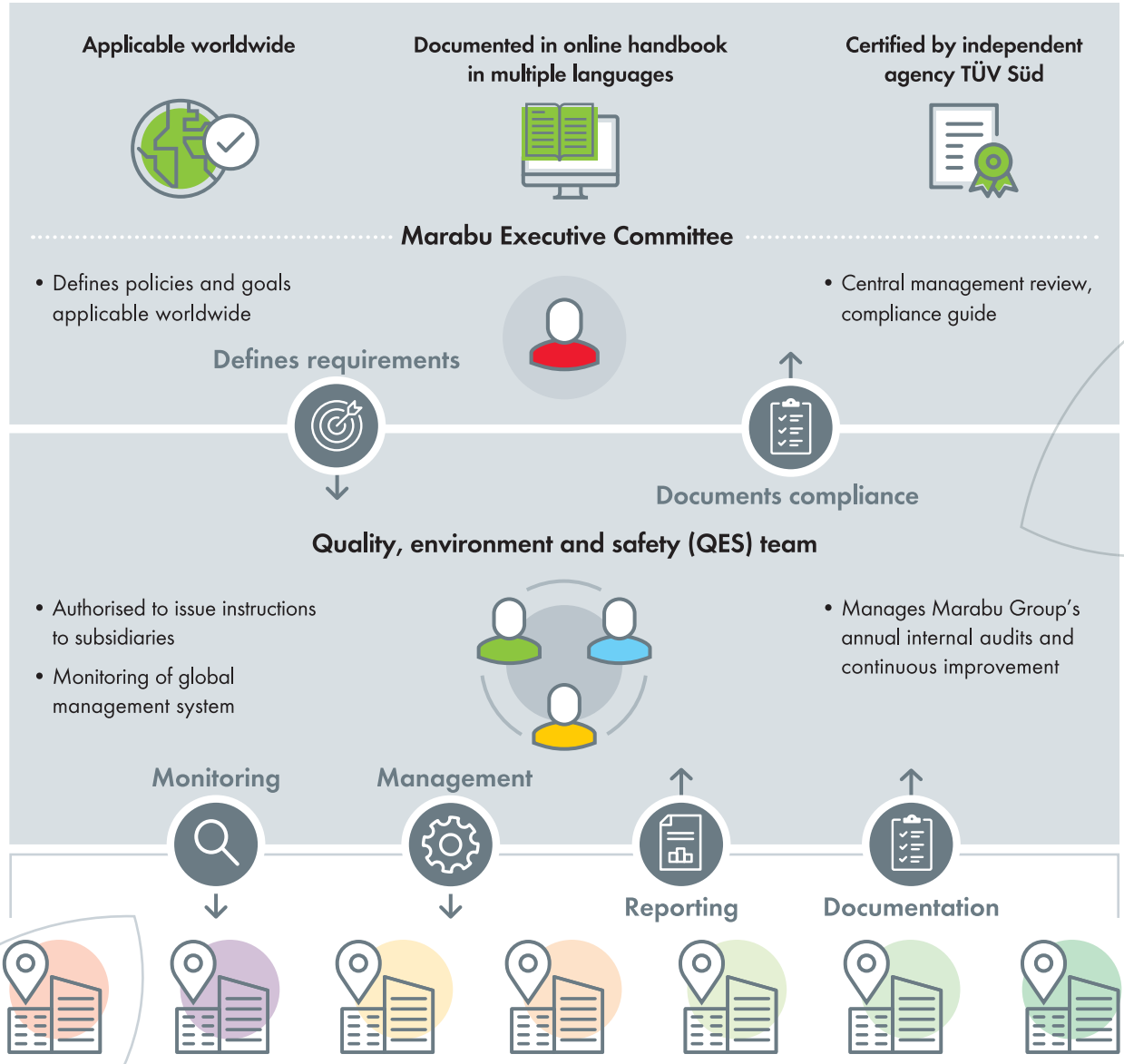


Where can the book be purchased?
Business Process Management Cases Vol. 2 is available from the online store of Springer publishing: https://link.springer.com/book/10.1007/978-3-662-63047-1
Relevant chapter: https://doi.org/10.1007/978-3-662-63047-1_19
Business Process Management Cases Vol. 2 ISBN: 978-3-662-63047-1

Chapter on Marabu's success story:
Cee K., Bruns I., Schachermeier A., Kaiser L.F. (2021) Adoption of Globally Unified Process Standards: The Case of the Production Company Marabu.
In: vom Brocke J., Mendling J., Rosemann M. (eds) Business Process Management Cases Vol. 2 Digital Transformation – Strategy, Processes and Execution (pp. 249-259).
Springer, Berlin, Heidelberg.

THE MARABU MANAGEMENT SYSTEM

Our Marabu Group global management system is monitored and certified on the basis of a matrix. The senior management at our headquarters in Tamm defines key parameters, such quality and environmental policies, and the annual goals for all sites, and verifies their compliance by means of an annual management review. The quality, environment and safety team assists subsidiaries with the adjustment of core processes in line with requirements defined by the parent company, and is responsible for the central planning of the entire management system and the continuous improvement process. Internal audits and KPIs are employed to measure the system's progress. The matrix has the advantage that individual sites are subject to spot checks by the accredited certification body, and typically a check or re-certification audit is performed every two to three years, depending on the standard, and the size and environmental relevance of the site. The exceptions are the headquarters, where the management system is verified every year, and China due to national regulations.



A GLOBAL COMMITMENT

INKS ARE OUR PASSION – SUSTAINABILITY OUR GOAL

Environmental protection, occupational health and safety, resource conservation, the circular economy, supply chain tracking and tracing, logistics, knowledge transfer and awareness raising are all key ways of strengthening sustainability within an organisation. Marabu Group has long set very high standards in this area. The objectives we have defined in our quality and environmental management system go beyond statutory requirements, and continue to be expanded and enhanced. The Environment, Quality and Safety department oversees all relevant activities at international sites, and offers advice and assistance. The team also supports all sites during their annual audits. The following chapters are dedicated to the individual Marabu company locations and not only describe what has been achieved, but also the current situation of each subsidiary within its sales territory.

127
TÜV audits
worldwide since 1995

Around **212** **tonnes**
of materials that can be
reused are collected annually
at all Marabu sites

25,234.8 **tonnes**
German & Scandinavian locations
have been reducing their emissions with
green electricity since 2007


Marabu

TAMM

SCREEN PRINTING INKS | PAD PRINTING INKS | DIGITAL PRINTING INKS | LIQUID COATINGS

GERMANY

- Research and Development
- Production: Printing Inks
- Logistics
- Administration
- Product Management
- Marketing
- Distribution/Sales
- Custom formulations
- Customer service

Certifications

- ISO 9001
- ISO 14001
- ISO 45001

246
employees at the site in total

Marabu GmbH & Co. KG,
printing ink production plant and company headquarters

MARABU TAMM – AWARDED SILVER

To make chemical products and protect the environment – surely that is a contradiction in terms? To an extent, it is. But we are working systematically to create "greener" products and manufacturing methods, to reduce waste, to conserve energy and natural resources, and to employ resources that are renewable.

At the same time, effectively protecting the environment is also about protecting human health generally, as high-quality air, earth and water, and less noise, are the basis for a healthy living environment.

Marabu, as a maker of inks, is a chemicals company that must comply with many statutory requirements overseen by regulatory authorities. Fulfilling these directives often calls for significant investment. But it ensures an intact environment and safeguards our own health.

Ultimately, environmental protection is a task for us all, one that requires all individuals and all institutions to pull together. And only those companies that are truly sustainable will survive. Major multinationals employ standardised ratings to compare their corporate social responsibility (CSR) and progress in terms of environmental performance, such as reducing greenhouse gas emissions.

A high-profile customer requires Marabu to voluntarily publish its greenhouse gas emissions, plus data on wood and water consumption, via CDP on a yearly basis. The Carbon Disclosure Project was established in London in 2000 with the aim of determining companies' climate risks, plus their mitigation goals and strategies, by means of standardised questionnaires. The CDP now manages the largest database of its kind, with reports received from 9600 enterprises, including the majority of DAX-listed companies. Worldwide, 317 enterprises have succeeded in qualifying for category A, the best of all (there are a total of six, from A to F), including 19 from Germany.

Since 2020, Marabu Holding has been in the middle of the ranking (category D in a ranking of A-F). Thanks to our efforts in recent years to further reduce CO2 emissions and other environmentally relevant measures, we have made the leap to one of the upper C categories in 2024.

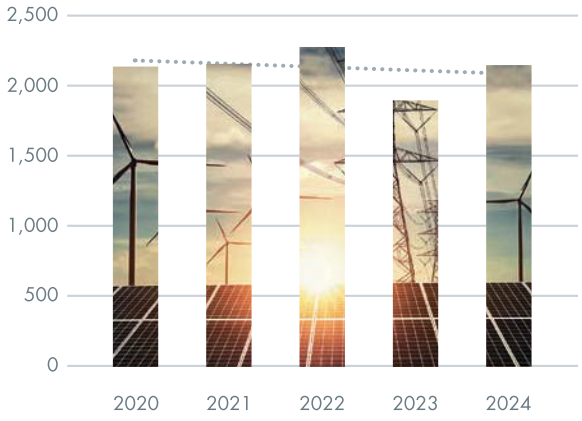
EcoVadis, the leading provider of universal sustainability ratings, has awarded Marabu the silver medal for its commitment to sustainability (Silver Sustainability Rating) every year since 2019. This marks us as one of the best 25% of companies to be evaluated by EcoVadis. The results of our CSR assessment, including the categories Environment, Labour & Human Rights, Ethics, and Sustainable Procurement, plus the overall rating can, following approval, be viewed by our customers.

ENERGY SAVINGS – A MARATHON NOT A SPRINT

Over the last few decades, there has been growing scientific evidence that natural and human-generated greenhouse gases are driving global warming. Against this backdrop, we decided in 2007 to source our electricity exclusively from renewable sources, i.e. green electricity, generated by wind, solar and hydropower. Additionally, we continuously seek to lower our absolute and specific electricity use per kg of manufactured ink through a variety of measures. In a company that has been operating for decades, energy efficiency is very much a marathon, not a sprint – and a task we consciously address, as the results speak for themselves. Thanks to a bundle of technical and organisational measures, the specific energy requirement for electricity was reduced from 1.29 kWh/kg of paint produced in 2005 to 0.71 kWh/kg in 2024. The interim increases in 2023 and 2024 are due to the electricity used for the construction site for the refurbishment of our location.

To cool our production processes, four individual legacy cooling units were replaced by a single state-of-the-art 300 kW system with ambient air cooling, i.e. that is able to harness the low outdoor temperatures during the colder months of the year. And the system also boasts other energy-saving features, such as a speed-adjustable fan that operates in accordance with the outlet temperature of the cooling water, and with a condensation temperature that adjusts to ambient air. The savings achieved in comparison with a system without these features is approx. 150,000 kWh to 200,000 kWh annually.

Electricity consumption in MWh/year



Electricity demand in kWh per kg of manufactured ink

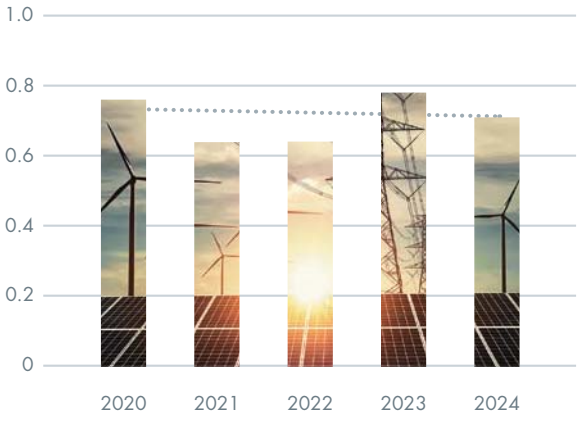


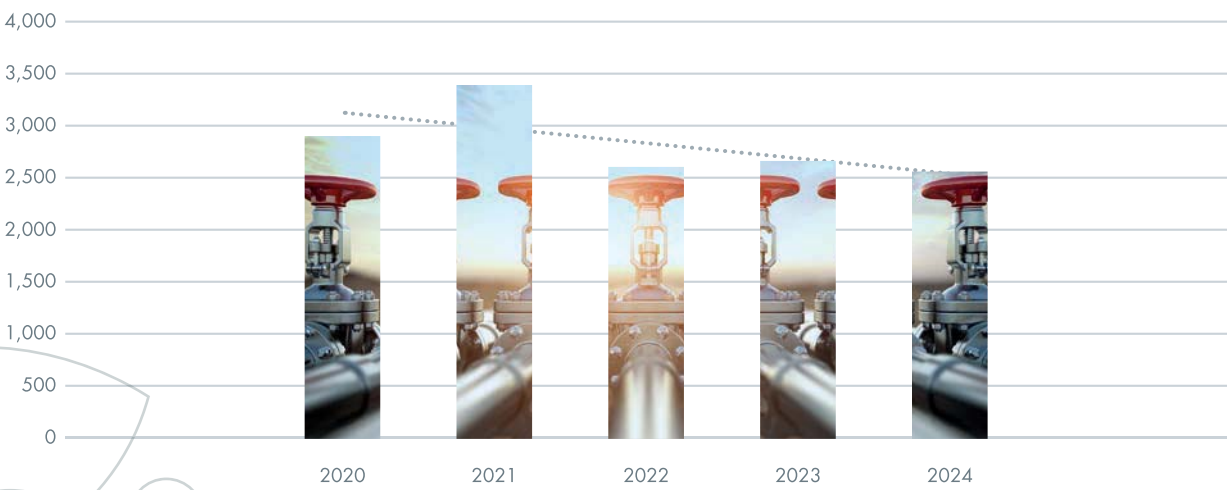
Image above: Refrigeration system for cooling processes in production (2021). Image to left: exhaust air scrubbing system with heat recovery

The five buildings at the site in Tamm are the result of various construction projects over the last 50 years, and are connected to a central gas-fired heating system. The amount of gas required has been fairly static for many years, and is a direct function of the number of cold days requiring active heating in any given calendar year.

In order to reduce gas consumption, a connection to the district heating network is therefore planned for 2027. The network for this is currently being expanded by the city of Tamm and Marabu has already registered as a major customer.

In addition to heating, we require gas for the afterburner system (thermal oxidizer). This system is responsible for 16% of gas consumption, corresponding to approximately 400 MWh annually. At temperatures of some 600° C, it almost completely oxidises volatile solvents in the air extracted from production areas.
The waste heat recovered from this process is employed for the in-house distillation plant and to dry production containers.

Gas consumption in MWh/year



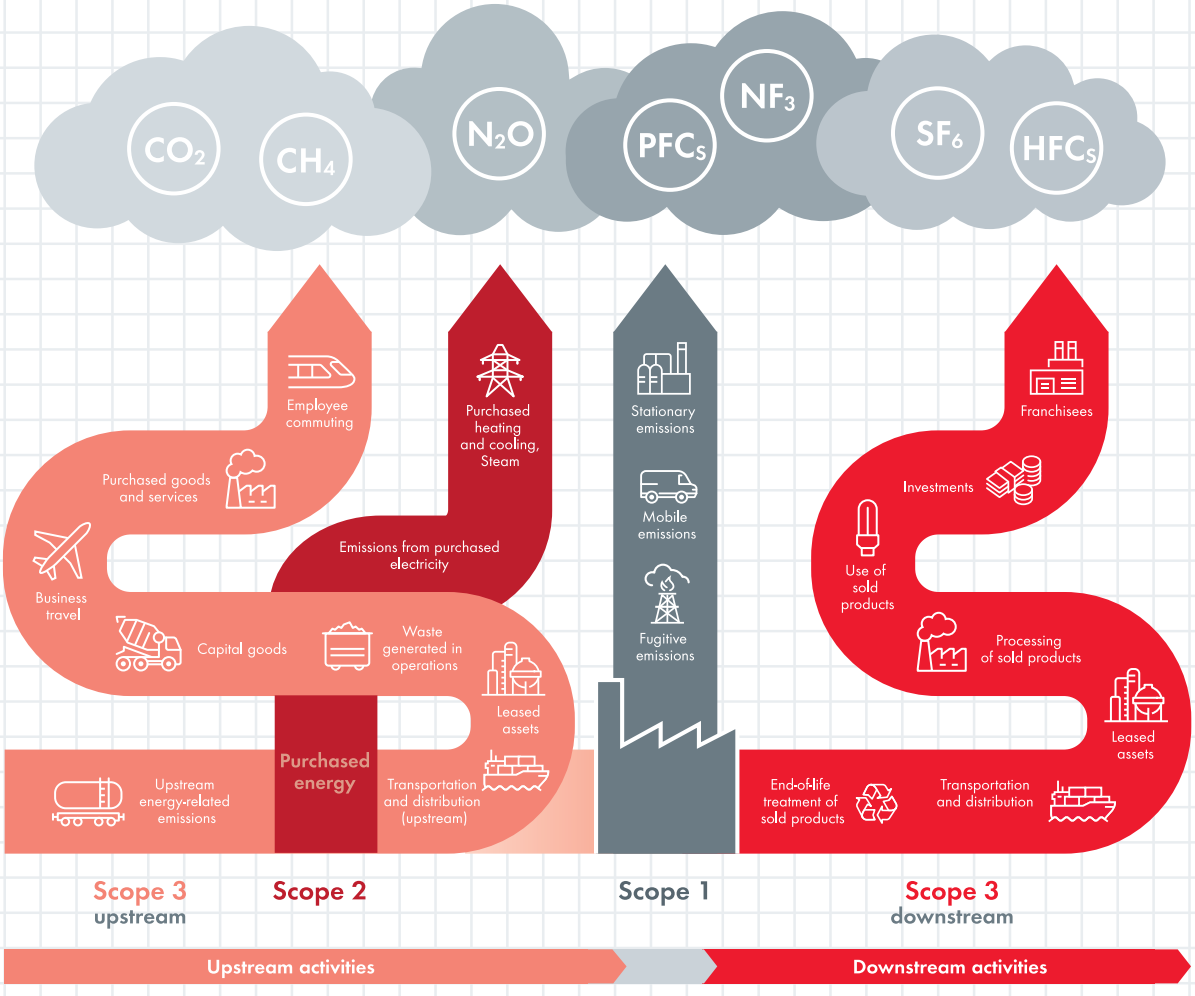
CLIMATE NEUTRALITY – THE SCOPE VALUE IS THE MEASURE OF ALL THINGS

The careful analysis of our energy consumption, the implemented savings measures and our conviction to further minimise our climate footprint despite growing production have led to the decision to commit ourselves to reducing our emissions by a further 20% over the next 10 years as part of the Baden-Württemberg Climate Alliance.

Investigation of all our CO_2 emissions – according to international standards and using reliable scientific data, broken down into Scope 1, Scope 2* and Scope *3, from the production of our raw materials to the delivery of our products – demonstrated that emissions from upstream and downstream value chain activities (Scope 3) are 14 times higher than our Scope 1 value, yet are far more difficult to reduce as we have fewer means of influencing them.

Marabu's Scope 1 value includes carbon dioxide produced by the combustion of gas, and fuel for company vehicles.

Greenhouse Gas Protocol emission categories (scopes)



*Scope explanation, see P. 40

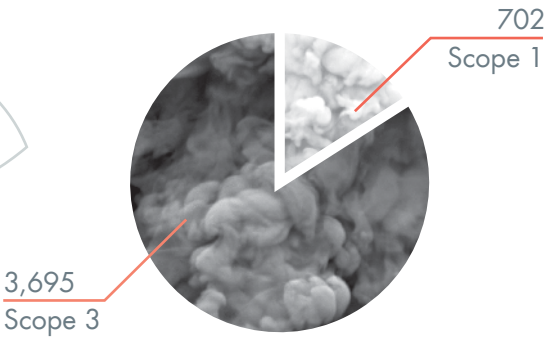
By enhancing the heating system, and purchasing only electric or at least hybrid vehicles, we can considerably lower our Scope 1 value. There are already 18 charging stations available for this purpose at Marabu in Tamm.

Our use of CO_2-free green electricity results in zero Scope 2 emissions. Nevertheless, we considerably lowered electricity consumption in recent years by switching completely to LED lighting, introducing shorter stirring times in ink production, deactivating unnecessary equipment during periods when there is no production, and purchasing low-consumption equipment and devices. Moreover, we generate our own electricity via a photovoltaic array and produce hot water via solar panels.

To lower our large Scope 3 volume, we are using less packaging material and are investigating the increased use of recycled materials.

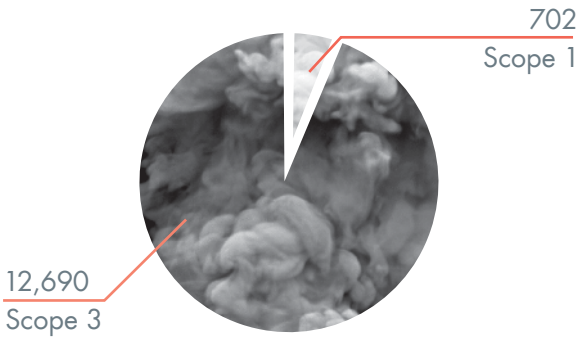
Where possible, we avoid shipping goods by air and keep business travel to a minimum. We are in favour of targeted working from home on the part of staff, as the pandemic has shown that the use of digital channels has a positive impact on emissions. In Baden-Württemberg in 2020, emissions in the transport sector fell by 18% (cf. statistik-bw.de 2021), and we also expect the next assessment of our Scope 3 emissions to show a marked decline in the volume attributable to transport.
The participation in campaigns supported by the company, such as 'Stadtradeln', in which the 'Mara-Bikers' took 2nd place in Tamm in July 2023 and saved 857 kg of CO_2 by cycling almost 6000 kilometres, underpins our shared desire to make a contribution to an intact environment.

Scope 1, 2 and 3 in t/year not including materials and logistics

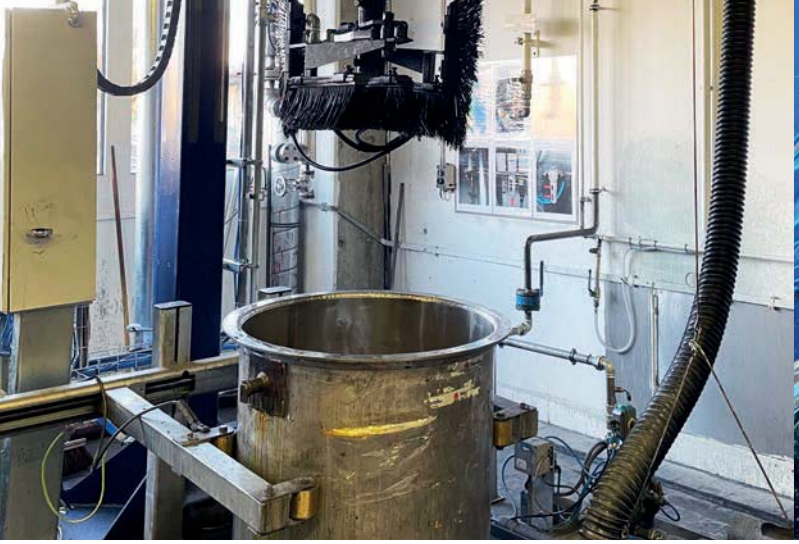


Scope 3 emissions, such as employee commutes, business travel, upstream gas and electricity, disposal of waste and other materials, canteen

Scope 1, 2, 3 in t/year including materials and logistics



All scope 3 emissions, including procurement of raw materials and packaging materials, and outbound logistics



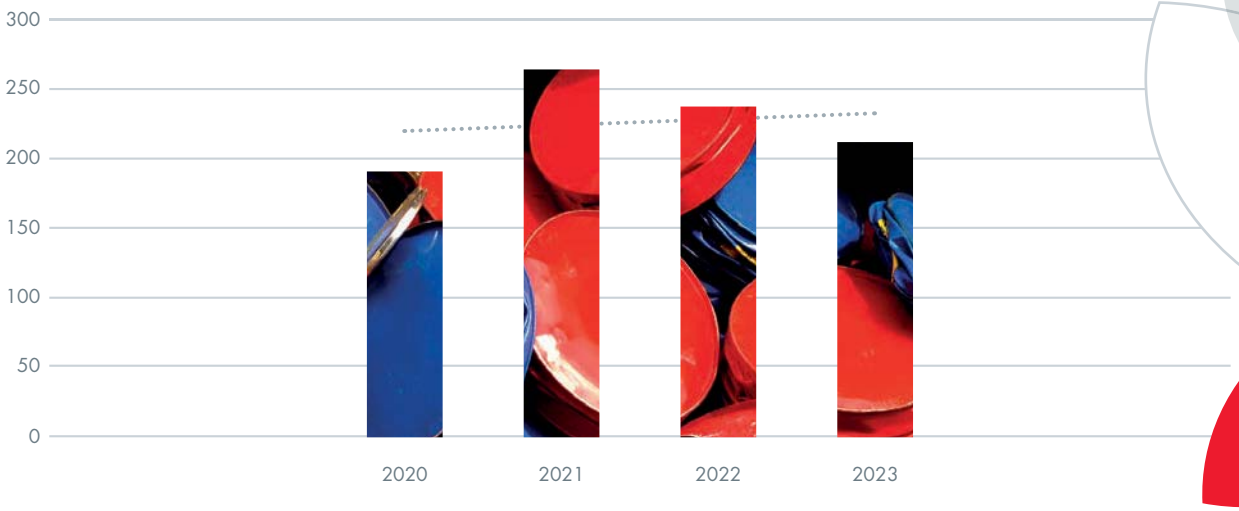
AVOIDING OR USING WASTE RATHER THAN DISPOSAL

Marabu implemented effective waste management processes at a very early stage. From the outset, there has been a clear focus on avoidance, and on segregating waste for recycling – leaving just a small amount of general household waste. We are also continuously reducing our paint waste through process optimisation.

By modernising our production processes, we are already saving on the use of raw materials and ensuring that waste is only produced to the extent necessary. For the unavoidable waste from our paint sludge, we have installed a distillation plant that filters the solvent content out of the paint sludge. We then reuse the recovered solvent to clean machines and containers and can therefore use it again and again in the cycle.

Detailed documentation on the origin of the paint waste via our ERP system ensures the necessary transparency of the cause of the waste and provides the data material for improvements to prevent waste from occurring in the first place.

Total volume of waste in t/year



LESS PAPER MEANS MORE FOREST

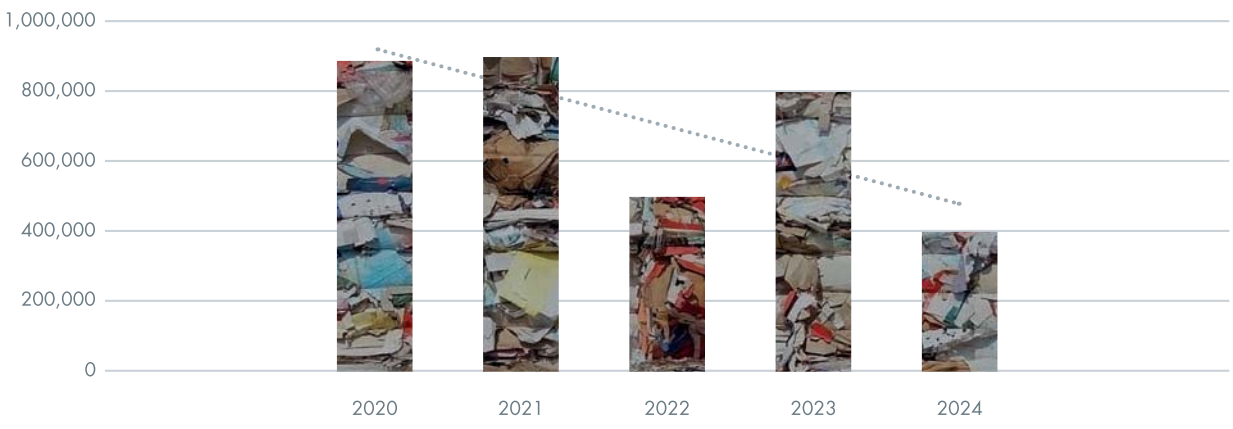
Background info on forestry

Almost one in five industrially felled trees ends up as paper. And paper consumption continues to grow worldwide –from 130 million tonnes in 1970 to 410 million tonnes in 2024. In terms of both paper use and production, Germany is in fourth place globally, behind China, the USA and Japan. Logging, approx. 30% of which is illegal, leads to annual deforestation worldwide of around 30 million hectares of land, a loss equivalent in size to the UK and Ireland combined. And this despite the vital importance of global forests as gigantic stores of carbon dioxide, influencing the climate and acting as a key habitat for flora and fauna. The paper industry has a key role in determining the future of our forests (cf. wwf.de 2022).

Marabu has been focussing on saving paper for many years. Thanks to the digital exchange of information and documents with customers and suppliers, paper consumption has been halved in the past 4 years from 900,000 sheets per year in 2021 to 400,000 sheets per year in 2024. We only use 100% recycled paper that has been awarded the 'Blue Angel' label.

The trend is clearly moving in the right direction: away from paper and towards digital communication channels to protect our forests.

Paper consumption in sheets/year



LOW WATER CONSUMPTION

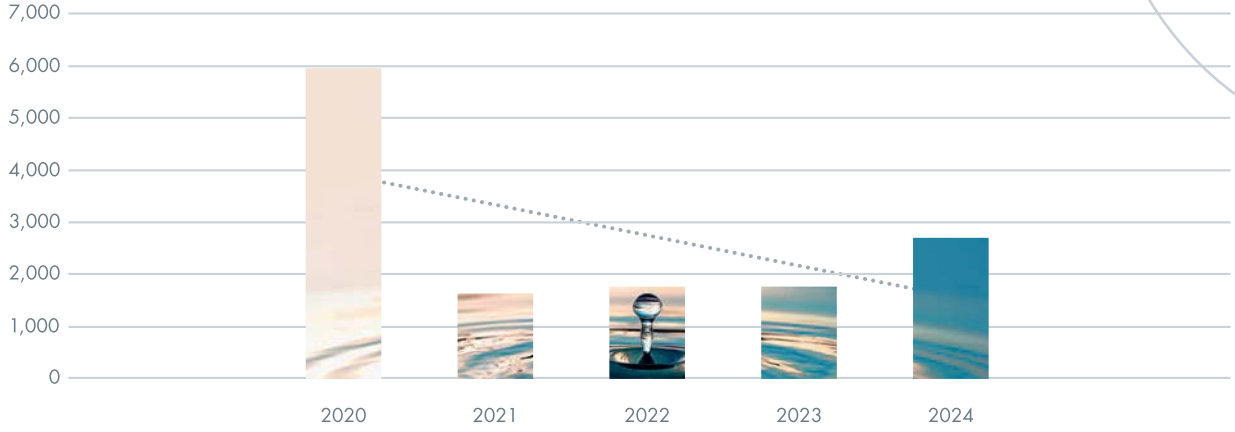
Water usage at Marabu in Tamm is of little ecological significance. Water is employed to cool machinery in closed-loop systems. In the future, however, water will be required in increasing amounts as a raw material for water-based inks.

Accordingly, waste water is currently of a composition comparable to that from private households, and can be discharged into the public sewage system, which takes it to a nearby treatment plant. Drinking water consumption increased slightly in 2023 and 2024 due to higher proportions of water-based inks and a construction site for the refurbishment of our location.

PROTECT NATURE TO PROTECT HEALTH

Especially critical for us as a printing ink manufacturer is packaging for food and personal care products. To uphold the exceptional quality standards that apply to the ingredients and manufacturing processes, Marabu decided to make the corresponding inks in line with Good Manufacturing Practices (GMP). GMP defines specific requirements regarding purity and quality over and above ISO 9001. It was developed by EuPIA and has become established as the standard for the relevant sectors. Following the successful implementation of the project, which involved 100% testing of the raw materials to ensure consistent quality, packaging can now be printed using our low-migration Ultra Pack UVFP ink range. Further inks are planned for qualification.

Water consumption in m^3/year



WORLDWIDE CERTIFICATIONS OF THE MARABU GROUP

A certified quality management system in accordance with ISO 9001 was implemented at our company headquarters in Tamm as early as 1995. In 2003, we expanded our commitment to environmental protection and sustainability by introducing a certified environmental management system in accordance with ISO 14001.

Since 2012, our company has also had an occupational health and safety management system, certified to the OHSAS 18001:2007 standard until 2021 and awarded the 'Systematic Safety' seal of approval.

In October 2023, our occupational health and safety management system was finally successfully certified by BG RCI in accordance with the successor standard ISO 45001:2018, known as SimS plus.

Since 2013, we have expanded our management system worldwide by introducing a QHSE requirements guide and successively certifying our subsidiaries as part of the Marabu Group multisite certification project.

In 2018, 2021 and 2024, the Marabu Group was recertified in accordance with the new ISO 9001:2015 and ISO 14001:2015 standards with extended requirements such as risk management, organisational knowledge and consideration of the product life cycle.

The Marabu headquarters in Tamm and our subsidiaries in seven countries (eleven locations to date) are currently certified to ISO 9001:2015 and ISO 14001:2015. Over the next few years, our global MMS will be successively expanded to include additional locations and standards

Certifications | Marabu GmbH & Co. KG | Marabu

TAMM PLANT INPUTS		2020	2021	2022	2023	2024
Energy						
Electricity	kWh	2,142,452	2,161,949	2,261,323	1,896,860	2,170,153
Natural gas	kWh	2,908,621	3,395,789	2,604,910	2,666,449	2,633,356
Total energy input	kWh	5,051,073	5,557,738	4,866,233	4,563,309	4,803,509
Raw materials						
Fresh water	m^3	5,965	1,772	1,781	2,706	
Binders and resins	t	450	542	490	395	
Solvents	t	1,293	1,320	1,223	1,096	
Pigments	t	278	50	37	46	
Fillers	t	110	120	95	108	
Additives/agents and photoinitiators	t	87	111	87	88	
Metallic and glitter effect materials	t	7	1.1	1.3	0.6	
Total raw materials	t	2,225	2,144	1,933	1,734	
Packaging						
Aluminium, aluminium composites, tin, sheet metal	t	222.58	202.37	169.78	166.24	
Paper/cardboard	t	158.48	197.83	105.45	136.32	
Plastic/plastic composites	t	96.5	126.83	152.89	66.35	
Total packaging	t	477.56	527.03	428.12	368.91	

TAMM PLANT OUTPUTS		2020	2021	2022	2023	2024
Gaseous emissions						
CO_2e Scope 1	t	779.87	n. B.	841.89	702.1	
CO_2e Scope 2	t	n. B.	n. B.	0	0	
CO_2e Scope 3	t	n. B.	n. B.	13,829.28	12,690.05	
Solid emissions						
Hazardous waste						
Ink and distillation sludge	t	79.75	95.68	79.81	53.14	
Waste ink	t	10.8	18.49	22.22	14.47	
Other	t	4	13.42	4.73	2.04	
Total hazardous waste	t	94.55	127.59	106.76	69.65	
Other waste and materials						
Mixed plastic and other waste	t	31.73	33.15	41.88	26.29	
Paper/cardboard	t	27.5	36.81	26.94	34.11	
Wood	t	22.77	5.57	4.61	5.55	
Scrap metal	t	23.5	57.37	61.5	75.23	
Other	t	0	1.6	0.7	2.24	
Total materials and other waste	t	105.5	134.5	135.63	143.42	0
Liquid emissions						
Waste water	m^3	5,965	1,652	1,772	1,781	2,706
Products						
Volume manufactured	t	2,818	3,859	3,649	2,432	3,039

GERMANY

BIETIGHEIM-BISSINGEN

CREATIVE COLOURS

- Research and development
- Production: Printing Inks
- Logistics
- Administration
- Product Management
- Marketing
- Distribution/Sales
- Custom formulations
- Customer service

Certifications

- ISO 9001
- ISO 14001
- FSC® 2013

85
employees in total at the location

Marabu GmbH & Co. KG,
Creative Colours plant

BIETIGHEIM-BISSINGEN – "PROJECT GREEN" FOR THE COMING DECADE

Our Creative Colours are almost entirely water-based and are designated as non-hazardous according to the CLP Regulation (classification, labelling and packaging of chemical substances and mixtures).

Development of an especially sustainable product

Yet we have even more ambitious plans. In 2020, the Creative Colours business unit decided to develop an especially sustainable paint. Two years later, we can state: mission accomplished. In spring 2022, we launched the water-based alkyd ink onto the market. Made with raw materials derived from vegetable oil, Marabu will commence manufacture of an entirely new type of product that is an attractive option for artists working on canvas and people pursuing a creative hobby on a variety of substrates.

At least 92% of this vegan product comprises raw materials of natural origin (including water and renewable materials).

Marabu paid close attention not just to the ingredients but also to the packaging. The tube requires up to 30% less input material than a conventional tube. Additionally, as the new tube material is thinner, it is easier to completely remove all its contents. The packaging is 100% recyclable if the cap is disposed of separately. The quality and ease of use correspond to the high made-in-Germany standards that Marabu is famous for.

But "PROJECT GREEN" is about much more than the development of a single product. It addresses all processes and products with regard to their environmental impact, and identifies potential improvements. With both product packaging and shipment packaging, Marabu not only pays attention to appropriate size, but also seeks to maximise the amount of recycled material used.

In the case of card, this can be as much as 95%, followed by up to 80% for plastic blister packs, and up to 40% for glass. But there are still areas that can be improved. For instance, we now prioritise banding for palletised shipments rather than stretch wrap wherever possible.

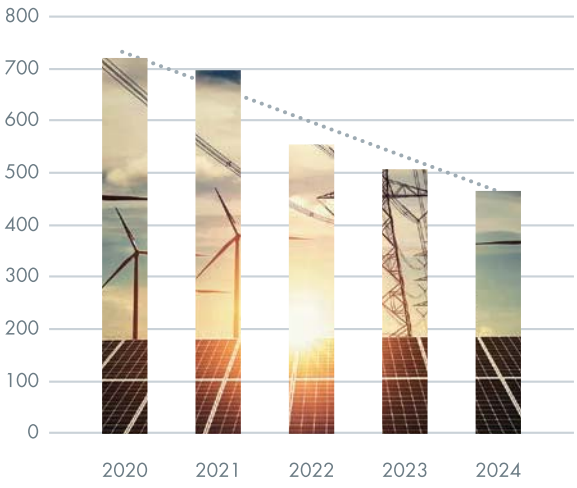
STATE-OF-THE-ART BUILDINGS WITH LOW ENERGY DEMAND

The Creative Colours unit is in a state-of-the-art industrial building, 2 km from Marabu headquarters, where all operational processes, from goods received, to manufacturing, to storage and shipping are efficiently arranged in close proximity to each other.

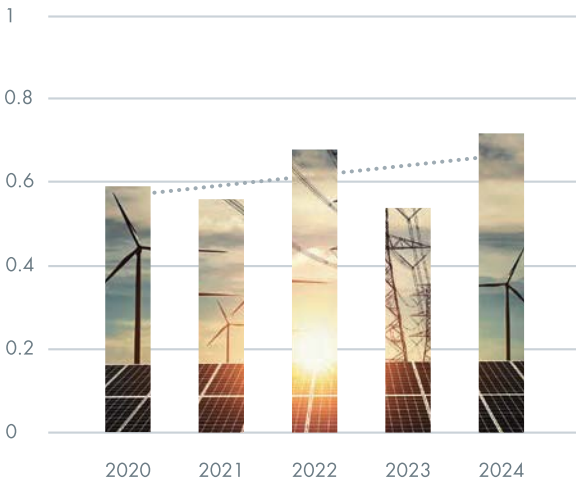
The building has large expanses of glazing, creating a pleasant working environment and enabling best possible use to be made of natural sunlight. Nevertheless, in recent years, all artificial lighting has been converted to LED technology. An advanced building control system ensures all lights, except for emergency lighting, are turned off outside of working hours.

As a result, the specific electricity requirement was reduced from 1.00 kWh/kg of ink produced in 2015 to 0.54 kWh/kg in 2023. In 2024, this value unfortunately rose again slightly due to insufficient production volumes compared to the basic electricity requirement.

Electricity consumption in MWh/year



Electricity demand in kWh per kg of manufactured paint



Images from left to right: Picking warehouse (2017); green roof retains moisture and cools through evaporation; atrium with greenery

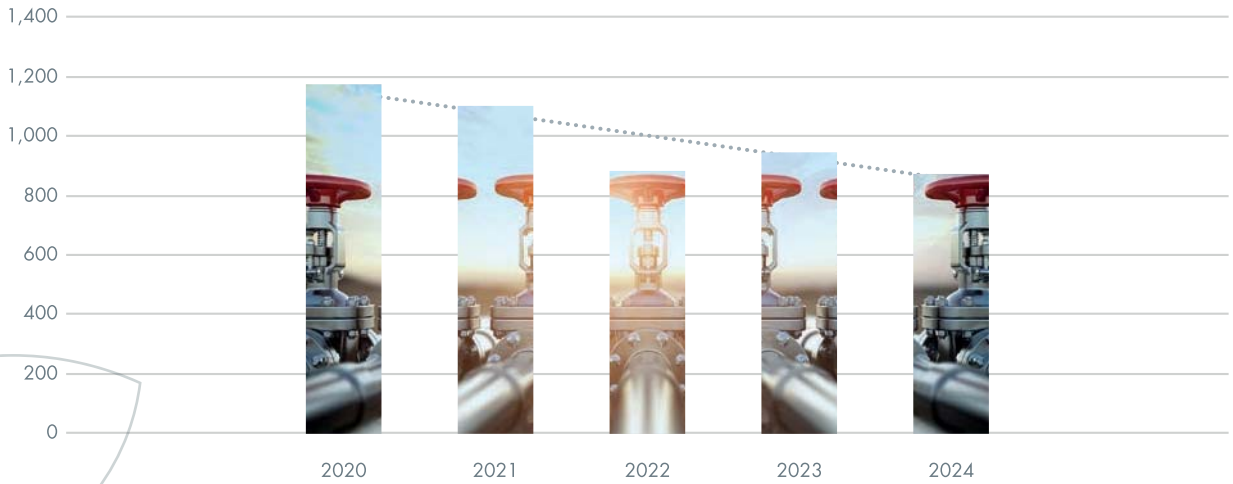
The advanced natural-gas heating system is also connected to the building control system and supplies heat in line with actual requirements. Moreover, the waste heat from the air compressors is used to heat the production areas in winter.

The building is well sealed and insulated. It also has double roller doors. Together, this contributes to the specific heat consumption of just approximately 80 kWh/m².

To minimise the environmental impact of the structure, plants are cultivated on large areas of the roof. This "green roof" retains moisture and, during warmer weather, helps cool ambient air through evaporation. As a result, only certain critical areas, such as the laboratories, require additional powered cooling at certain times of day in the summer. Air conditioning serves, on the one hand, to ensure compliance with temperature thresholds defined by legislation governing workplace health and safety. On the other, it ensures consistent conditions for paint quality control checks – the ideal interior temperature for this process is a constant 23° C.

Due to the good energy efficiency of the building, the Scope 1 value at the Bietigheim-Bissingen site is only 272 tonnes per year, while the Scope 3 value is 16 times higher at over 4480 tonnes. Reducing the CO_2 share, together with our suppliers and forwarders, will also be the major challenge in the near future.

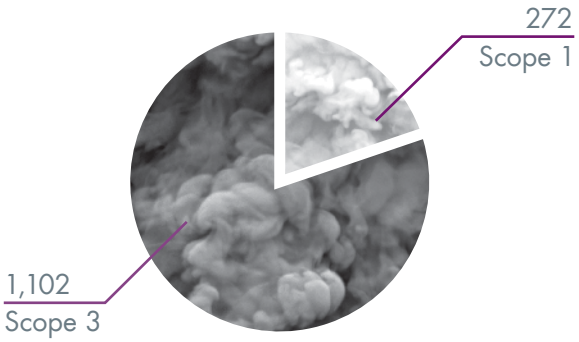
Gas consumption in MWh/year



Scope 3 emissions are mainly caused by purchased goods and services. The raw materials used account for the largest share of this. By substituting raw materials, we reduce emissions without compromising the quality of our products. Saving on packaging is an ongoing process.

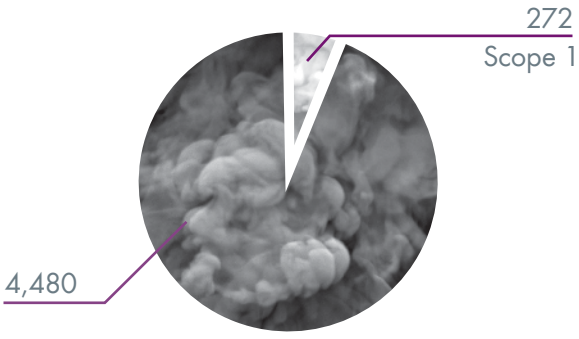
In a large number of projects, we have switched from plastic packaging to cardboard packaging. This increases the proportion of recycled material and reduces plastic consumption. We are also continuously reducing Scope 3 emissions in logistics by procuring materials locally and minimising air transport.

Scope 1, 2, 3 in t/year
not including materials and logistics



Scope 3 emissions, such as employee commutes, business travel, upstream gas and electricity, disposal of waste and other materials, canteen

Scope 1, 2, 3 in t/year
including materials and logistics



All scope 3 emissions, including procurement of raw materials and packaging materials, and outbound logistics

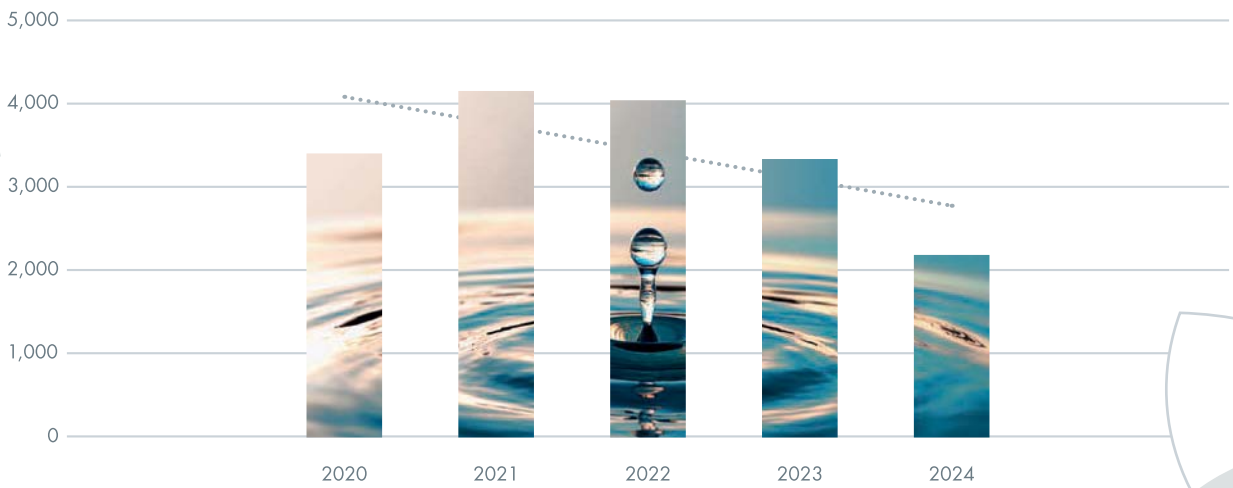
CLEAN WATER AND NO HAZARDOUS WASTE

In contrast to the items made at our plant in Tamm, where binders are largely based on artificial resins containing solvents or UV-curable acrylate-oligomers, our Bietigheim facility makes paints with aqueous emulsions. Water is therefore part of the final product. Water is also employed to clean metal containers used in production. Waste water from this process is purified in a dedicated in-house treatment plant, making it suitable for disposal via the public sewage system. Regular analysis of the waste water by a recognised inspection laboratory has demonstrated that the quality of the water is far better than statutory thresholds. Our specific water consumption per kg of product is approximately 3.4 l.

A slight disappointment with regard to waste water treatment is the relatively large amount of sewage sludge generated by the use of flocculants, despite compression via a chamber filter press. Following experiments with new chemicals, we have established that it will be possible to remove pollutants while producing some 80% less sewage sludge, i.e. a reduction from 17 t/a to just 3-4 t/a. With the retrofit of the treatment system complete, we commenced conversion to the new method in autumn 2021. This change will have a positive impact on our annual waste figures.

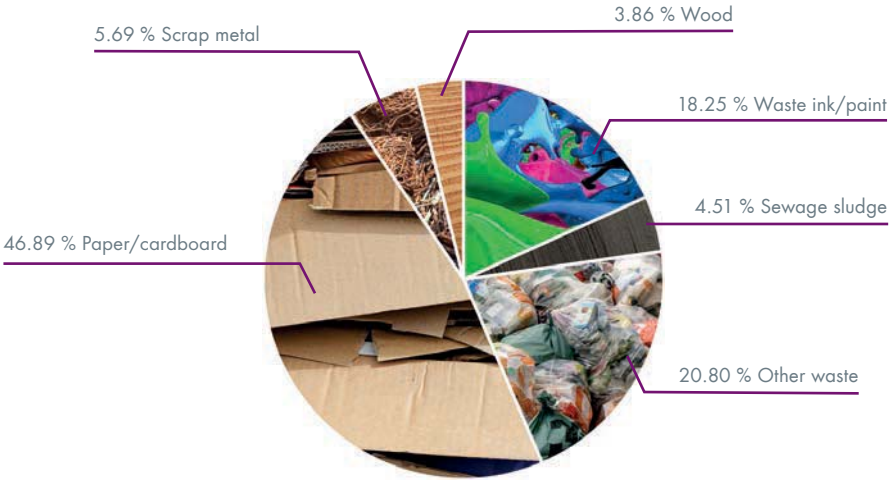
At our Bietigheim plant, too, we regard the waste generated as raw material. Although we have not been able to end the correlation between the total annual volume of waste and production volume, the various waste types are collected separately and sent to recycling.

Water consumption in m^3/year

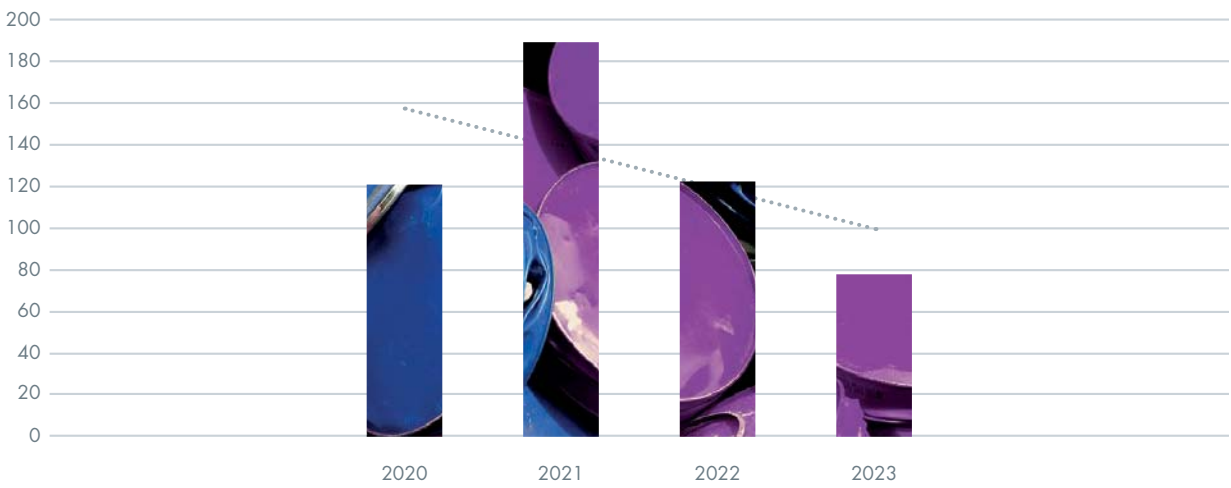


Images from left to right: collection tank for water treatment system, air conditioning for laboratory, air extraction system in laboratory, green outside space with pond

Composition of waste in per cent (BBI) 2023



Total volume of waste in t/year



WOOD PRODUCTS FROM FSC®-CERTIFIED WOOD CULTIVATION

When purchasing wooden goods, Marabu only uses wood from well-managed forests. The "Forest Stewardship Council®" was founded in Rio de Janeiro in 1993 to promote ecologically appropriate, socially beneficial and economically profitable management of forests worldwide.

Marabu has been listed in the global database of FSC®-certified companies since 2013. Since then, all items made of wood or with wooden components such as brushes, pencils, stretcher frames and easels have been made from FSC®-certified wood and are labeled FSC 100%. In 2020, Marabu expanded the FSC® certification to include the FSC MIX label and also offers drawing pads with this label. The FSC RECYCLED label will be added from 2022.

Enjoy creating without overexploiting nature – by purchasing painting accessories from Marabu, everyone can make a small contribution to protecting the forest through their shopping habits.

FSC™
www.fsc.org

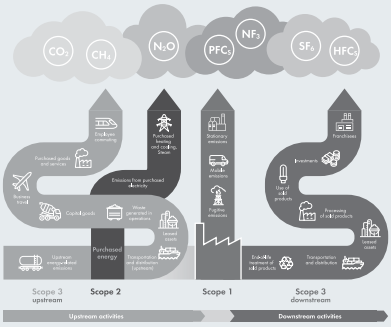
The mark of responsible forestry

FSC™ C118917

BIETIGHEIM-BISSINGEN PLANT INPUTS		2020	2021	2022	2023	2024
Energy						
Electricity	kWh	725,931	699,772	555,944	493,634	467,378
Natural gas	kWh	928,006	1,103,843	885,436	951,342	868,718
Total energy input	kWh	1,653,937	1,803,615	1,441,380	1,459,650	1,336,096
Raw materials						
Fresh water	m^3	382	350	210	190	
Binders and resins	t	350	252	197	197	
Solvents	t	51	29	23	15	
Pigments	t	94	35	14	12	
Fillers	t	244	155	136	90	
Additives/agents and photoinitiators	t	57	54	15	28	
Metallic and glitter effect materials	t	1	1	0.9	1.1	
Total raw materials	t	797	526	386	337	0
Packaging						
Glass	t	86	71	45	66	
Aluminium, aluminium composites, tin, sheet metal	t	5.1	0	0	0	
Paper/cardboard	t	110.19	201	124	42	
Plastic/plastic composites	t	157.35	106	72	67	
Total packaging	t	358.64	378.00	241.00	175.00	0.00

BIETIGHEIM-BISSINGEN PLANT OUTPUTS		2020	2021	2022	2023	2024
Gaseous emissions						
CO_2e Scope 1	t	203.6	n. B.	300.79	272.28	
CO_2e Scope 2	t	0	n. B.	0	0	
CO_2e Scope 3	t	n. B.	n. B.	6,854.57	4,479.77	
Solid emissions						
Hazardous waste						
Paint/ink and distillation sludge	t	17.09	21.32	12.15	3.52	
Waste paint/ink	t	18.42	32.13	21.32	14.24	
Other	t	0	2.35	0	0	
Total hazardous waste	t	35,51	55,80	33,47	17,76	0
Other waste and materials						
Mixed plastic and other waste	t	21.45	26.15	23.24	16.23	
Paper/cardboard	t	62.94	80.77	52.44	36.59	
Wood	t	12.13	24.64	7.65	3.01	
Scrap metal	t	1.5	2.21	6.62	4.44	
Other	t	0	2.35	0	0	
Total materials and other waste	t	98.02	136.12	89.95	60.27	0
Liquid emissions						
Waste water	m^3	3,411	4,176	4,049	3,341	2,200
Products						
Volume manufactured	t	1,227.60	1,252.43	805.10	578.66	652.01

Explanation of Scopes



In order to achieve the 1.5 degree target of the Paris Agreement, CO_2 emissions must drop significantly and as quickly as possible. To do this, companies must measure their carbon footprint and create a report that is defined according to uniform criteria. This is the only way for industries and companies to present their CO_2 emissions along the supply chain in a comparable manner and ultimately also to show the improvements. The greenhouse gas (GHG) protocol was drafted back in 2011 with the participation of several NGOs. The GHG Protocol divides emissions into 3 scopes: Scope 1, 2 and 3.

Scope 1 includes all direct emissions arising from the activities of an organisation or its subsidiaries (emission sources: heat, cooling and steam generation, the company's vehicles and air conditioning leaks);
Scope 2 includes the indirect emissions from electricity, heat and steam that companies buy from utilities;
Scope 3 includes the other indirect emissions in the supply chain (activities along the value chain - both upstream at suppliers and downstream at customers), (cf. fidelity.de 2022).

References to literature and sources

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