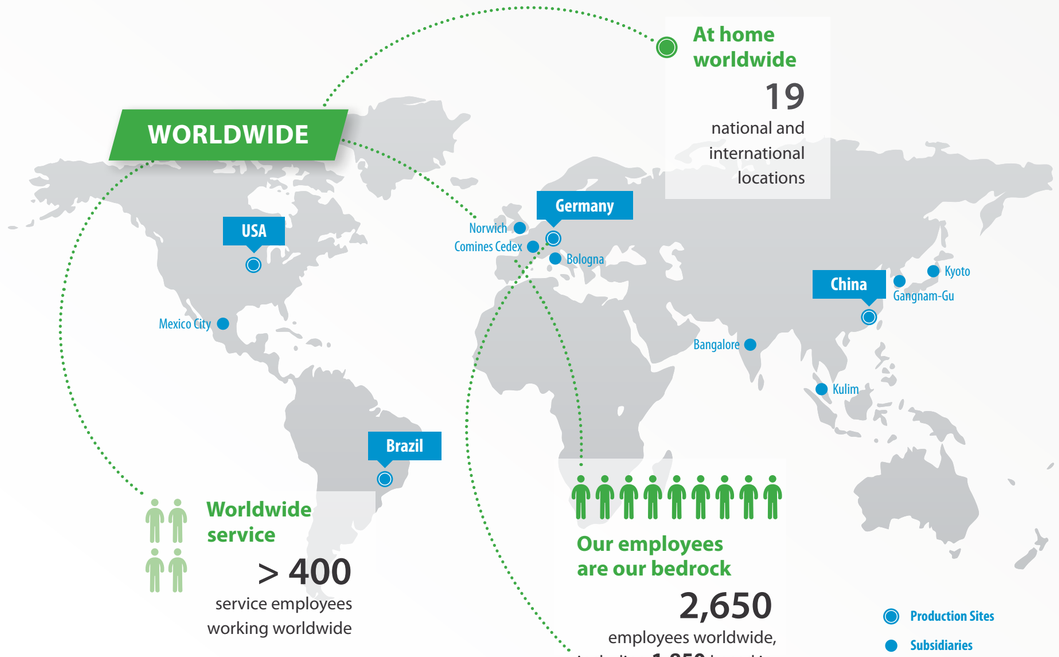
Circular Packaging

SHAPING TOMORROW'S SUSTAINABILITY TODAY

OPTIMA

AN OVERVIEW OF THE OPTIMA GROUP



THAT'S WHAT OPTIMA STANDS FOR

Optima supports companies worldwide with flexible and customer-specific filling and packaging machines for the market segments pharmaceuticals, consumer goods, paper hygiene and medical devices. As a provider of solutions and systems, Optima accompanies companies from the product concept through to successful production and throughout the entire machine life cycle. 2,650 experts around the globe contribute to Optima's success. 19 locations in Germany and abroad ensure the worldwide availability of services.

We care for people

SUSTAINABILITY AS AN OPPORTUNITY FOR GROWTH

One of the most important reasons why sustainability is one of our core issues is the desire to safeguard the world for future generations. They should also be able to enjoy a green, healthy, and, above all, better world, as well as being committed to environmental protection in the future. As a family business, being responsible for our children and grandchildren has always been important to Optima. Why do we need to act? You only need to take a glance at the news - climate change, famine, and oceans filled with garbage. Did you know that one species goes extinct every ten minutes and that the oxygen that we breathe is becoming scarcer and scarcer? The consequences of climate change are becoming more and more visible every single day. Nature does not negotiate with humans. To summarize: if we do not maintain our life support systems in good working order, then humanity will no longer have a means of survival. No one can be in any doubt that something has to be done. The survival of humanity depends on environmental and social sustainability. What was once frequently considered an issue for idealists is now generally recognized for its urgency, even at the highest level. New, increasingly stringent rules are in place and they need to be followed. When regulations are introduced or tightened, manufacturers need to step up. However, sustainability challenges companies far beyond this context. Only those companies that comply with the regulations can keep their operating licenses, but for those who are prepared to go further and transform themselves to become more sustainable, they will gain a "license" that is at least as important as the opportunity to grow. A successful model may include strengthening the brand, upgrading the product range, reducing unforeseeable risks, and introducing new business models with a focus on sustainability.

PACKAGING SOLUTIONS

Packaging protects products from degradation, makes them durable, manageable, and traceable, and generates unique selling points. It is understandable that the sustainability debate focuses on them, but this is not always justified. Packaging only accounts for 3.5 percent of the carbon footprint of a product, and a lot of materials are the only ones capable of fulfilling this important protective function. That is why we do not focus on short-term solutions based on current trends, but on long-term packaging solutions that take into account the entire value chain and the circular economy. Working together with you, we are developing future-proof packaging solutions in line with the credo: only as much packaging as necessary and as little as possible. Or to put it another way: honest packaging that really brings greater sustainability and protects the product at the same time.

Cooperation is needed throughout the value chain in order to develop optimized packaging.

It is not possible to produce the food we need in sufficient quantities throughout the world. Many foods spoil quickly and cannot be transported far or stored for long periods of time. With climate change, growing areas are shifting and we need to do an even better job of protecting our food. Packaging protects food from spoiling and means it can be stored for longer periods of time. Packaging contributes to feeding the world's growing population. 30 percent of greenhouse gas emissions are related to food. One third of all the food we produce is wasted. Preventing food waste reduces the global climate footprint by eight percent. On average, a product's climate footprint is thirty times greater than the packaging. Only around 3.5 percent of the carbon footprint of packaged food products is due to packaging. If, as a result of the packaging, just 3.5 percent less food is thrown away, then packaging is already contributing to sustainability.

This means that the packaging's environmental benefit is five to ten times higher than the packaging's environmental cost. Reducing portion size also helps to reduce food waste. We see ourselves as part of a network. Cooperation is needed throughout the value chain in order to develop optimized packaging. A more holistic evaluation of new solutions is also needed to assess the sustainability of the packaging.

Packaging needs to protect the product, be easy to hold, and is preferably traceable, with a unique selling point. There is too much packaging that is poorly designed, and there's no denying it. However, there are some materials that are used for a specific reason. They are the only means of protecting the product from spoilage. If large quantities of these packaging materials are replaced purely for the sake of fashion and not due to the circular economy, the problems are simply shifted onto another material.

Our credo here is only as much packaging as is necessary and as little as possible.

SUSTAINABLE CAPSULES: SO THAT COFFEE REMAINS A PLEASURE

It is undisputed that capsules have great advantages in terms of packaging. It is also undisputed that a capsule that is completely recyclable and has the best characteristics is the superior capsule. Working in collaboration with two partners, we set out to develop packaging that is both completely recyclable and meets the highest standards. The result is GreenLution - a capsule system that is much more than just a sustainable capsule. This also includes a resource-efficient packaging system made by Optima and a recyclable covering film. This commitment has been rewarded with a certification.

Plastic is a valuable material that, whenever possible, should be re-integrated into its own production cycle. This was the main aim of the collaboration between Optima, Wipf and säntis packaging – to develop a fully-recyclable coffee capsule.

The capsule that we have developed together features a single-material capsule with a recyclable lid film and a compatible packaging system. It is based on a polypropylene-based single-material capsule RECY+ Cap made by säntis. This is combined with the fully recyclable WICOGREENLINE top film from Wipf with excellent barrier properties. The GreenLution capsules are filled using a sustainably designed packaging system by Optima, which in turn is based on the OPTIMA CFL capsule filling machine, and it is precisely adapted to the recyclable capsules. The OPTIMA CFL combines high filling accuracy for a variety of types of coffee with minimal space requirements, optimized film utilization, lower energy, and gas consumption with maximum efficiency, and a minimum production reject rate of below 0.05 percent. This also means that filling can be made as sustainable as possible. Existing plants can also be suitably retro-fitted to make it easy for customers to make the switch to more sustainable products.

Trust is good, inspection is better. We agree, and the capsule system has been certified as recyclable by the cyclos-HTP institute and the environmental service provider Interseroh.

Through this successful collaboration, we have shown that our approach to creating greater sustainability together with partners from the entire value chain is the right way to go. The development of GreenLution means that we are working with our partners to promote a sustainable closed-loop system for production and package recycling.

Very good to recycle

Certified by Cyclos

HONEST PAPER PACKAGING FOR A BETTER ENVIRONMENT

Optima aspires to fulfill 100 percent of our customers' wishes. We also demand 100 percent from sustainable packaging materials. What does that mean? No separate materials that have to be sorted for reprocessing at great expense or mostly end up as residual waste. Having paper on the outside may give the consumer a more positive feeling, but on the inside, it is often plastic-coated to make it easier to handle in the packaging process. Alternatively, fillers are added to preserve the elastic properties of the film material. But honest packaging should be made of a single material that is completely recyclable. We have set and achieved a goal in collaboration with our customer Fripa: wrapping paper in paper and doing it 100 percent and with no additives.

In toilet paper, there is a lot of choice, but on the shelves at the store, there is one characteristic that makes them all the same: the paper is all packed in plastic film bags. With Fripa, we wanted to change that, so we developed a specially adapted machine. The result of our experience and expertise is a solution that does not compromise on quality or speed - quite the opposite in fact.

An OPTIMA OSR pouch packaging machine provides the basis for this. The modules can be precisely adjusted, work with required precision and are gentle on the material. To do this, we have developed a new and innovative closure mechanism. This has resulted in completely recyclable paper packaging without any plastic coating or fillers. That is why we call this packaging honest packaging. At Optima, sustainability is also linked to flexibility. Therefore, the OPTIMA OSR at Fripa can do both film and paper, and of course, in all different sizes. There are no long stops in production. Conversion takes no longer than a normal format change. It is no surprise that we have teamed up with Fripa: As a manufacturer of high-quality sanitary paper, Fripa began to use environmentally friendly processes at a very early stage, and has impressed its customers with its innovative products. Paper packaging is also far from new terrain for Optima: Optima has already been packaging products in paper packaging for 30 years. This experience is an important foundation and serves us well today. In cooperation with Optima, we have succeeded in continuing to perfect our packaging over the years.

"We are convinced that Optima has the great expert knowledge needed to transfer what we have learned to the paper packaging sector," says Torsten Bahl, a member of the Fripa management team, summing up our innovation project.

RECYCLABLE PRODUCT PROTECTION FOR HAPPY BABIES

Hygiene products demand plastic packaging in order to ensure maximum product protection in areas with very high humidity. The sleeve bag was created with the aim of developing recyclable packaging for plastics.

PE bags are often made of composite material and are printed, making them hard to recycle. But there are better alternatives.

100 percent recyclable sleeve packaging consists of an unprinted mono-polyethylene (PE) bag and a printed paper insert, or a PE insert as an alternative. When the transparent PE bag is recycled, high-quality recycled material is produced, from which PE bags can be made again in line with the cradle-to-cradle principle.

We recommend that paper be used as the insert material. Very effective bleaching technologies have been used in paper for a long time now. This means that after recycling, the paper fibers used can be reused as packaging material. In this type of packaging, the paper and PE are not glued together. This enables them to be easily separated by the consumer or by extant sorting technology.

The inlay is inserted into the packaging process inline. This means that this step can be integrated into the existing packaging processes. New machinery is not required. This also contributes to resource-efficient production. This also enables maximum flexibility for design changes, such as personalized imprints when using inline printers. This distinguishes products at the point of sale and appeals to consumers. So it's a win-win situation for our customers and the environment.

SMALL USERS - SUSTAINABLE EFFECT: REDUCE PACKAGING IN AN ENVIRONMENTALLY FRIENDLY WAY

Concentrates in solid or liquid form are used in the food, cosmetics, chemical, and pharmaceutical industries to reduce the transport volume of certain products. Some examples include milk powder or instant coffee. In powder form, these are more durable and easier to use, as they fit into smaller packages. This reduces transport volume and CO_2 emissions. In addition, they take less space to store. Concentrates are therefore of great importance and support a basic principle of sustainability: reduction.

A concentrate has a minimal amount of water. The weight and size of the substance are reduced to a minimum. The concentrate is transported and enriched with water immediately before use. This reduces the transport effort by up to 90 percent. The use of fewer transport vehicles such as ships or trucks means significantly lower CO_2 emissions. Concentrates are thus an important contribution to climate protection.

Optima's core competency is the high-precision filling of liquid and solid concentrates. Both with large containers and the smallest packaging sizes for our customers. Optima's extremely precise filling technologies also reduce product loss to a minimum. Refill solutions are also possible with our machine solutions. Concentrates are sold in a simple, environmentally friendly packaging, while the application is carried out in more elaborate original packaging. Examples of refill solutions can be found in the market segments of detergents and cosmetics.

REDUCED TRANSPORT VOLUME

SAVING RESOURCES: SO THAT PURE WATER DOES NOT BECOME A LUXURY GOOD

Water is a precious and limited commodity, especially in its pure form. Highly sterile water (WFI) is used for cleaning vials. The production of WFI is complex and expensive. Reducing water consumption is an important issue for us and our customers. Saving water in the long term reduces costs and protects the environment.

Optima is pursuing several approaches to reduce water consumption at the washing machine. Special water nozzles have already been used for many years for the internal cleaning of vials. In addition, the WFI used for final cleaning is collected once, filtered, and reheated. This water is used for pre-cleaning the vials. The washing area is divided in such a way that collected WFI is reused once. This ensures that the water quality does not drop and the cleaning performance always remains the same.

A new approach is to increase the hydromechanical cleaning effect of water. A water jet loses its strong mechanical cleaning effect shortly after it hits the glass surface. This is where the new approach comes in. New energy in the form of additional compressed air is introduced into the system. The flow off rinse water is captured by the air jet and sets the water into a fast, approximate spiral movement. The special nozzle needle was developed and optimized by means of simulations carried out with high-performance computers. Real tests showed that water consumption could be reduced by up to 45 percent compared to the conventional variant.

CLIMATE-FRIENDLY COOLING: THE REFRIGERANTS OF THE FUTURE

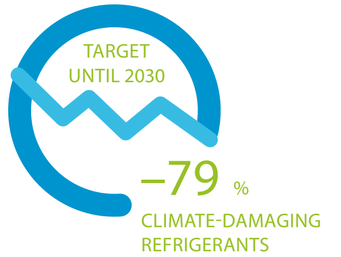
Many processes in the pharmaceutical industry are in a state of change due to political regulations regarding climate change. Refrigeration is particularly affected, as conventional technologies are becoming more and more restricted. For plants with lifetimes of more than 30 years, the focus is on future-proofing and the quality of the plants. Freeze-drying plants depend on stable and available refrigerants. Our claim is not to compromise on safety and plant performance and to make freeze drying processes as environmentally friendly as possible.

For refrigerants, conventional technologies are mostly based on F-gases, which today account for 1.5 percent of the total warming potential. By 2050, this is expected to increase to 6 to 9 percent of the total greenhouse gas unless action is taken.

Natural refrigerants have no or minimal global warming potential and no ozone depletion potential. Unlike man-made refrigerants such as CFCs, HCFCs and HFCs, natural refrigerants are substances that occur naturally. They are part of natural biogeochemical cycles and do not form permanent residues in the atmosphere, water or biosphere and are also more cost-effective.

As a result, we are committed to counteracting the growing climate impact and reducing climate-damaging refrigerants to 21 percent by 2030. That is why Optima has been successfully using refrigerants with relatively low global warming potential in freeze drying systems for some time and offers solutions with natural refrigerants and nitrogen cooling. Natural refrigerants are not only suitable for freeze-drying systems – Optima also relies on efficient refrigeration with natural refrigerants for the generation of cooling water for commissioning and the Factory Acceptance Test.
Our customers also benefit from the environmentally friendly and future-proof solutions we use in our plants

One project to realise this goal is freeze-drying plants for our customer CSL, which use the natural refrigerants ethane and propene. Our plants thus comply with the current directives – and retrofitting is no longer necessary over the entire service life of the plant.



ALWAYS ONE STEP AHEAD: PACKAGING CONCEPTS

Let's take the road to genuinely sustainable packaging together. Speak to our experts. Our extensive knowledge and network means we can create the best conditions for getting a step closer to the goal of 100 percent circular packaging. We would like to use two examples to show you the ongoing development of two existing packages into even more sustainable packaging.

Your market knowledge and production expertise form important building blocks for new solutions. We look forward to this partnership.

InlineCan

Optima has developed the InlineCan with the aim of avoiding CO_2 emissions caused by the transportation of empty cans, and reducing storage space to a minimum. Several systems have been installed to handle this packaging concept.
The original concept for the InlineCan is made up of several materials. From today's standpoint, this needs to be rethought in terms of the circular economy.
Other positive features are product protection, logistics, and handling by the consumer. The circular economy is also an important factor for the future, and it requires components and materials be kept to a minimum.
Thus, the InlineCan remains a prime example of a holistic, intelligent packaging concept that helps reduce CO_2 emissions and storage space. Together with you, we are building on this foundation.

Portion packaging

Over the past 20 years, the portion pack market has developed into an important market segment. The solution concepts offer optimal product protection, very easy handling and top quality. There is a right solution for every requirement, whether it is made of aluminum, plastic composite or a single material. The basic principle of sustainability indicates the need for a circular economy in this market segment too. In partnership, Optima is developing new materials and coordinated processes for the future.

Refillable – the alternative to reusable

Smart, high-quality packaging is too valuable for single use. A refill solution offers a sustainable solution by reusing the primary packaging multiple times. There are already potential solutions for this idea in the cosmetics sector.

SUSTAINABLE MACHINE SOLUTIONS ARE THE FUTURE

Our machine solutions are also making a contribution to sustainable development. We are pushing ahead with solutions and developing our activities in a responsible and economically successful manner. Here at Optima, this means contributing to the quality of life while reducing the consumption of resources and emissions that are associated with our value creation. At Optima, we understand that sustainable management is a shared social responsibility. In other words, we are not the only ones looking to reduce our environmental footprint. We also aim to mobilize our partners to make contributions to sustainability. We are aware that this is a never-ending process that needs to have its roots in the company's DNA and be put into practice every day by every single employee.

Highest levels of availability

Through our digital initiatives, the Smart Services, the availability of our machines is maximised and weak points in production become visible. This reduces unnecessary downtime and makes production more sustainable. For one customer, we were able to reduce the number of stops by about 85 percent.

Production space

A compact design enables our customers to double their output per square meter of production area. At the same time, production areas can become considerably smaller. An example of this is the OTIMA EGS. The footprint of this machine has been reduced by over 40 percent.

Efficient use of mediums

During production, it is important to use the required media such as gases and water as efficiently as possible. We have reduced the consumption of protective gases by half. Furthermore, very well optimized machine cleaning processes for freeze dryers ensure that 70 percent less water is needed.

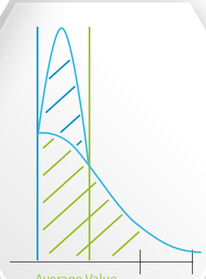
–70 %
WATER CONSUMPTION

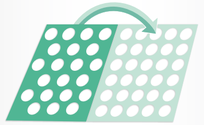
Sustainable machine recycling

The correct recycling of machinery makes a major contribution to resource conservation. Therefore, as a manufacturer, we offer the option of ending the life cycle of the machine sustainably upon request and returning the individual parts to the material flows in a professional manner – thus benefiting the environment.

Process accuracy

Our high-precision "topping-up" dosing process reduces underfilling and overfilling of packages to an absolute minimum, thereby achieving an increase in output of 500,000 cans per year.





Utilization of packaging material

The optimal utilization of packaging materials is a key aspect of sustainability and TCO considerations. We increase material utilization by 39 percent by optimizing the configuration of cutting modules.

Maximizing life cycles

Our OPTIMA Total Care life cycle management program maximizes machine life. For instance, predictive maintenance can be used to make full use of the maximum service life of parts subject to wear. Rebuilding and overhaul programs mean that the equipment can be adapted to meet market needs, without having to be completely replaced.

Energy

We have reduced energy consumption by 38 percent through the use of cutting-edge sealing technology. One of the key focuses of our new machine development is energy reduction.

Heating process sealing head

OUR CONTRIBUTION

As a family-owned company, we consider ourselves to be especially committed to ecological, fair, and successful long-term management. More than ever, packaging issues need to be reconciled with social responsibility, all without compromising on design and product protection. Optima is your partner for developing sustainable packaging solutions, both for new projects and for converting existing systems. For many years now, we have been successfully cooperating with packaging material manufacturers and providing you with advice – from the product concept to successful commissioning.

Packaging made from mono-materials, e.g. from single-variety plastics or 100 percent paper, recycled plastic packaging, organic-based and biodegradable plastics are already being processed using Optima equipment.

At the 1992 UN Rio de Janeiro Conference on Environment and Development, which is considered to be a milestone in integrating environmental and development efforts, three terms were defined, also referred to as the "three-pillar model of sustainable development."

Ecological sustainability is the term used to describe the aim of preserving nature and the environment for future generations. This covers the preservation of biodiversity, climate protection, maintaining cultural and natural areas in their original state, and generally treating the natural environment with respect.
The term economic sustainability postulates that the economic system is structured in such a way that it provides a sustainable basis for income and prosperity. Here, protecting economic resources against exploitation is particularly significant.

The term social sustainability views societal development as a path that allows all members of a community to participate. This includes a reconciliation of social forces with the aim of achieving a sustainable, globally just and viable society.

At the 2015 World Summit on Sustainable Development held at the United Nations Headquarters in New York, the 17 "Sustainable Development Goals" were adopted by the United Nations General Assembly (see chart). As a responsible mechanical engineering company, Optima is able to contribute to seven of these goals.

UNITED NATIONS DEVELOPMENT GOALS

A milestone in integrating environmental and development efforts.

NO POVERTY

Worldwide, Optima offers secure jobs with appropriate rates of pay and comprehensive social benefits. With our training programs, we promote the knowledge of our staff around the world.

NO HUNGER

Optima's innovative filling and packaging concepts ensure a long shelf life for products, which means that they can be distributed worldwide. Through our packaging, Optima wants to provide all people with access to food in sufficient quantities.

HEALTH AND WELL-BEING

Both essential products and everyday consumer goods are produced and packaged to the highest standards by our machines.

QUALITY EDUCATION

Extensive staff training opportunities are available. Optima employs above-average numbers of trainees, students, and interns, and we offer them high-quality training.

DECENT EMPLOYMENT AND ECONOMIC GROWTH

We are a family-owned company, so at Optima our staff and sustainable business practices are particularly important to us. Our workforce is the keystone of our success.

SUSTAINABLE CONSUMPTION AND PRODUCTION

For example, we promote sustainable production through the efficient use of materials on the machine. Computer simulations and our expertise mean that we can reduce test materials used in test operations. Our commitment is also completed by the correct recycling of end-of-life machines and by extending our machines' life cycles.

MEASURES FOR CLIMATE PROTECTION

New machines are always designed with sustainability in mind. We consistently use renewable energy. By making generous use of mobile work, digital communication formats, and services, we reduce our travel and hence our CO_2 emissions.

SUSTAINABILITY AT OPTIMA – TRANSPARENT, HONEST, AND TRACEABLE

Here at Optima, we value honesty and transparency. This is how we engage with our customers in projects, and the way we handle the issue of sustainability. Four certifications ensure that our commitment is transparent and understandable: 100 percent of our electricity is from certified hydroelectric power. We heat with regional district heating or available geothermal energy. The electricity from our system of solar panels is fed into the electricity network. Optima practices successful waste management. This includes waste reduction and separation, our own recycling center and waste separation concepts in the office and assembly areas. We rigorously avoid disposable tableware and have reduced the use of test materials with computer simulations. The crowning jewel of our commitment is the planting of a flower meadow to provide a habitat for bees and insects. Our next major project: in the medium term is converting the vehicles in our fleet to hybrid and electric vehicles.

Sustainability can be measured

EcoVadis provides companies with comprehensive CSR (corporate social responsibility) ratings via a global cloud-based platform. This makes it possible for us to identify our potential for optimization at an early stage and to take action to give you the highest possible transparency on our CSR and sustainability performance.

DIN EN ISO 14001 is a standard for environmental management systems that is accepted and applied worldwide. Key requirements involve the planning, implementation, monitoring, and improvement of environmental targets. We are working on auditing in accordance with DIN EN ISO 14001 in this area.

The **Carbon Disclosure Project** is a non-profit organization founded in London in the year 2000, with the aim of ensuring that companies and municipalities publish their environmental data like climate-damaging greenhouse gas emissions and water consumption. We also share our data to create transparency.

The implementation of an energy audit according to **DIN EN 16247** is a systematic examination of the energy use and energy consumption of organisations, facilities, buildings and systems and therefore an important basis for improving energy efficiency and reducing energy consumption.

SUSTAINABILITY IN TRAINING AND STAFF DEVELOPMENT

At Optima, awareness of sustainability is there right from the start. As early as the recruitment phase. Interviews are increasingly being conducted as video interviews, thus reducing the need for long travel arrangements. The same approach is adopted in dual studies, where we offer rent subsidies to enable our students to live close to their campus. Progress can also be made in day-to-day operations by using digital resources. Web-based training and digital HR documents avoid wasteful use of paper and toner and simply create a feel good factor.

SUSTAINABILITY IN OCCUPATIONAL HEALTH MANAGEMENT

Only employees with high levels of well-being are capable of high performance and have the right mindset to manage resources responsibly. This is why we attach great importance to systematic and sustainable occupational health management (OHM). Increasingly, this has become the cornerstone of Optima's corporate management, because sustainability also includes treating the health of our workforce in a responsible manner.. We favor a long-term approach to OHM.

MAKING ROOM FOR SUSTAINABILITY

At Optima, we consider sustainability not only when developing machines and throughout their life cycle, or when new packaging concepts are being devised. We also prioritize sustainability in the very small, practical aspects of everyday life. The use of renewable energies, environmentally friendly transportation technologies, waste separation, and social commitment all play an integral role in our corporate social responsibility, as well as our sustainability strategy.

100 %

530 KW

100 percent of **our electricity** comes from hydroelectric power. Our buildings always comply with the highest energy standards in force and are heated with local remote heating. Solar panels on our roofs contribute to the increasing use of renewable energy.

Our vehicle fleet has already been switched in part to electric vehicles and we are receptive to new, environmentally friendly mobility concepts. Good transport connections mean short transportation routes.

For our construction projects, we make use of existing industrial and commercial space. We keep our land requirements down to a minimum and create offset areas. A flower meadow including a bee hotel has been planted at Optima Materials Management to provide a home for this important insect, the bee.

We have **a central function for waste and hazardous materials management** to ensure strict waste separation in logistics, assembly and our offices.

Sustainable business also means responsible business. We fulfill our social responsibility by making donations to social organizations like Doctors Without Borders and through the sponsorship of a variety of cultural and sporting events.

More Information:
www.optima-packaging.com/sustainability

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