

Green Lighthouse

Charting the course for a green future
at our Freiburg site





At Pfizer, we are committed to improving health and well-being at every stage of life. Determined to provide access to safe, effective, and affordable medicines, we develop innovative new products and steadily improve the treatments available today. Thousands of scientists in our 100,000-strong workforce around the world engage in R&D. Here in Germany, 4,000 people at five sites help Pfizer achieve these goals. But our corporate responsibility extends beyond health to our precious environment. Pfizer believes strongly in conserving energy and resources, thereby enabling sustainable growth to everyone's benefit across the globe.

One of the most advanced facilities of its kind, our Freiburg site produces 8.5 billion tablets and capsules every year, including medicines to combat cardiovascular diseases, alleviate pain, and treat epilepsy. Part of the Pfizer family since 2000 and staffed with 1,000 people, it stands as a testament to what can be accomplished in climate protection. This flyer is here to share this success story with you. It shows you how far we have come on our green journey and describes what we are doing to stay on course to a greener tomorrow.



Dear readers,

Pfizer has, since the 1990s, put into action a green strategy aimed to vigorously protect the environment and conserve resources. Our company blazed a trail in the use of renewable energies for others in the pharmaceutical industry and beyond to follow. The Freiburg site stands as a beacon for this sustainability drive. Its many green projects have earned widespread recognition within the Pfizer Group and throughout the region.

Our plant meets more than 90 percent of its energy needs with renewable sources. A solar power system was up and running at the Freiburg plant as early as 1996. One of the first of its kind in the region, it has been producing eco-friendly electricity ever since. But there is more to our sustainability drive than that. Take, for example, Europe's largest wood pellet-fired heating system. It helps us reduce the plant's carbon footprint by some 5,000 tons, saving €500,000 in energy costs every year.

We are confident that sustainability pays off over the long run - both in environmental and economic currency. Renewable technologies enable us to steadily reduce our energy needs, ultimately making our medicines even more affordable. The Freiburg Pfizer plant has earned the blessings of many outside experts, who have confirmed that we are on the right track. The facility won the Baden-Württemberg Environmental Prize in December 2010. And the international non-profit network ISPE (International Society for Pharmaceutical Engineering) commended the plant for its exemplary sustainability strategy, naming it the Facility of the Year 2011. We take great pride in this distinction.

The success of this initiative rests upon the commitment, drive, and dedication of our staff. I owe them all a debt of gratitude. Our green strategy is made up of so many different facets; this brochure touches on each briefly. Here's hoping you enjoy the reading.

Axel Glatz, Freiburg Plant Manager





This view presents the Pfizer site from the east. The SPRING building, our new admin and lab facility, is in the foreground at the bottom left.

The Green Lighthouse

Local citizenship figures prominently at Pfizer. We are determined to contribute to the communities in which we work and live. After all, life is our life's work, and our medicines help many people. The same holds true for our efforts to research and develop new treatments. But our commitment extends beyond health care. Companies – especially those with a rich and varied skill set – owe a debt to the society that sustains them. What better way to live up to this responsibility than by protecting the environment and conserving the natural resources we all share? And so Pfizer has embarked on a green journey. Our next destination is 2012, by which time we aim to meet some 35 percent of all our energy needs with renewable sources. This will mark a major milestone, with many more to come.

Pfizer is very serious about going green. The Freiburg site is charting the course with its peerless energy concept, and not just for our company but for the global pharmaceutical industry. Today, renewable sources provide 93 percent of the energy consumed by the plant. Within the span of just seven years, carbon emissions were down from 13,000 tons to a mere 650 tons annually.

This green journey will take us around the world to do our part in

1. Mitigating climate change and its impact
2. Leading the way in product stewardship
3. Affording access to clean water

Reconciling ecological and economic interests, Pfizer's green journey will bring long-term benefits to both the environment and the company. The positive impact of these benefits has inspired our employees to put their knowledge and ideas into action at every location, raising awareness about environmental issues. The strategy has also gained the full support of our shareholders. Like our customers and patients, they are urging us to make green products and adopt sustainable practices.

The company introduced the first guidelines for lowering energy consumption and reducing greenhouse gas emissions in 1996. Our full-fledged energy and climate protection program was launched in 2005. Freiburg has since made more than 250 eco-friendly and energy-saving measures a reality. Highlights include large-scale projects such as erecting the SPRING lab and office building for €35 million, installing Europe's largest wood pellet-fired heating boiler, and constructing a geothermal system.

Now Pfizer aims to take this sustainable energy concept out into the world to all our locations. Freiburg is our Green Lighthouse, a shining beacon lighting the way within the Pfizer Group. But the site's success in securing its climate-friendly energy supply is no reason to rest. The green journey is far from over. We are rolling out new technology to further reduce the plant's ecological impact. Take, for example, our Green Footprint initiative: It encompasses the product's full lifecycle, from the raw materials, through the supply chain, and all the way to the shelf.

Alternative energy solutions for tomorrow's industry

Energy costs and climate protection goals figure prominently in the future of industrial companies, as World Energy Outlook (WEO) and International Energy Agency (IEA) studies attest. With good reason: To survive and thrive, manufacturing companies are compelled to improve energy efficiency and reduce their carbon footprint.

Pfizer's Freiburg site has made huge strides in energy conservation, maximizing individual systems' energy efficiency, minimizing loss, and extending recovery capacities. The entire plant's carbon footprint has shrunk dramatically with the use of renewable biomass, geothermal, and solar power, notching up another impressive achievement in climate protection.

Biomass is one of the cheapest forms of renewable energy. Whereas fossil fuel prices are expected to continue to soar, experts predict that the price of pellets will remain broadly in line with inflation rates.

Our next step towards a greener future may well entail using biomass in a combined heat and power plant. Trigeneration is the ability to produce electricity, heat, and cooling from a sole source. It could take us even further down the road toward our climate protection and energy conservation destinations. Powered by renewable energy sources throughout the year, the site would be even less exposed to volatile oil prices. Smart grid-enabled technologies could also drive down energy costs and even feed electricity generated on-site into the public grid. That way, we would have a hand in decentralizing and stabilizing power grids.

The Freiburg plant has good cause to stay on course for sustainability. The opportunity to make our products even more affordable and the public recognition that comes with winning so many environmental awards are two more very compelling reasons.



2007: Pfizer Freiburg wins the Pfizer Green Building Award for its SPRING project (Strategic Plant Restructuring).



2010: The Pfizer site in Freiburg receives the Baden-Württemberg Environmental Prize 2010 for its exemplary commitment to climate protection and sustainable business development.



2011: The Pfizer Freiburg site wins the Facility of the Year award in the Sustainability category, an international award for pharmaceutical manufacturers working in the healthcare industry.

Reaching higher with kaizen

The Pfizer Goes Green initiative set some very ambitious goals for 2012. The Freiburg plant surpassed these targets back in 2009. It exceeded expectations by applying the principles of kaizen, a Japanese philosophy that sees excellence as an object of constant pursuit. Every Pfizer employee is on a never-ending quest to improve processes. Our people support and inspire one another, brainstorming new ideas, sparking positive change, and making our company that much more competitive.

The plant's management has embraced kaizen. It now provides signposts for our roadmap to corporate governance. First experts used statistical tools to analyze energy use. Then we made improvements by putting the kaizen method into action. Now the applied principle of continuous improvement makes manufacturing and quality management ever more efficient at the Freiburg site.

Nothing is more important to the kaizen mindset than combating waste. Economics and the environment are two sides of the same coin when it comes to waste prevention. The Freiburg site was able to slash costs by applying kaizen principles, which supports our mission of providing access to affordable medicines. This effort was so effective that the international Kaizen Institute singled out the Freiburg plant's production, packaging, quality assurance, and laboratories for its 5S Best in Class rating. This honor goes to companies with world-class, lean manufacturing processes and cleaner, more efficiently organized workplaces. Pfizer was the first pharmaceutical manufacturer to earn an invitation to this elite club.

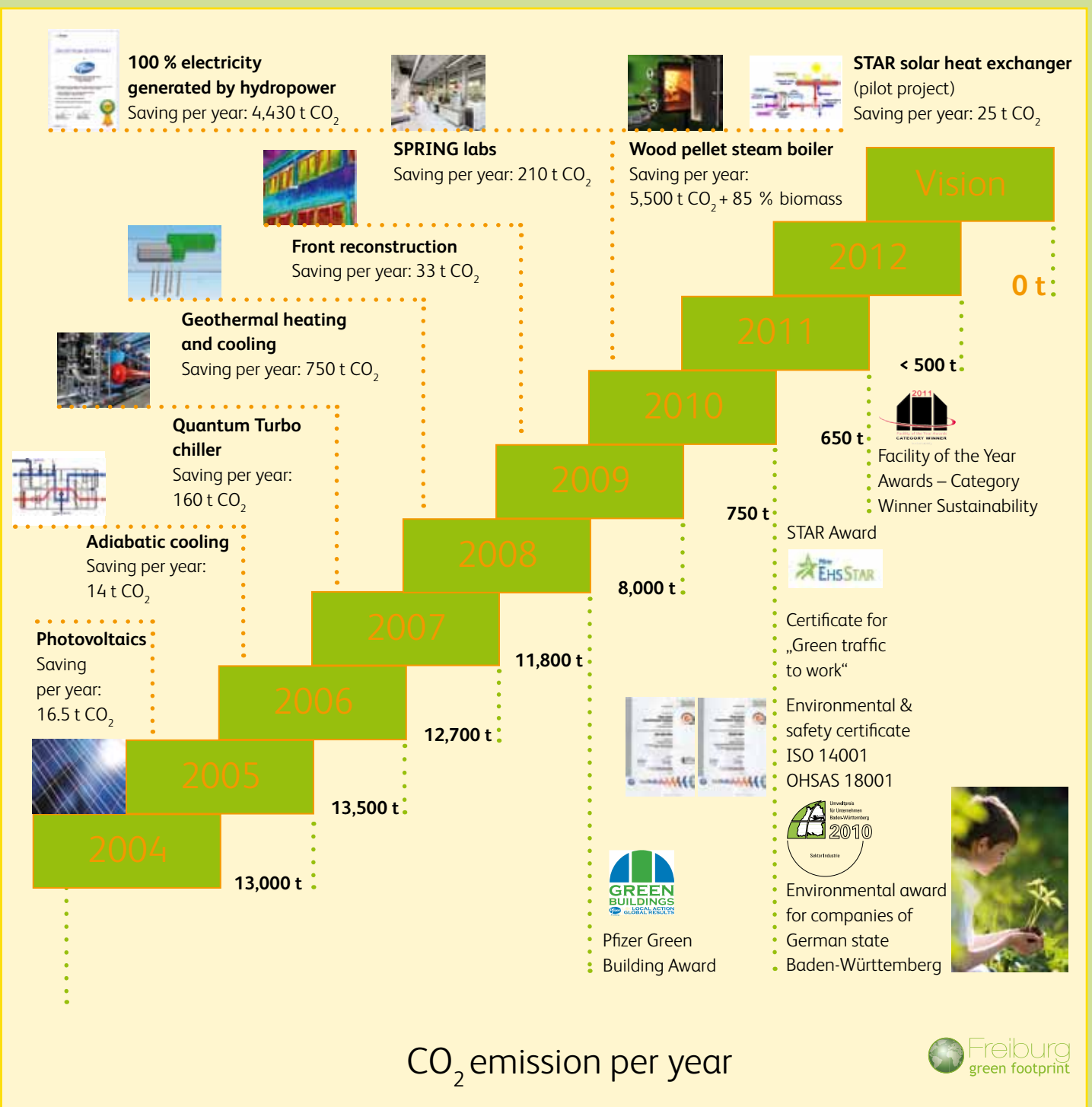
	Pfizer targets	
	Global by 2012	Freiburg as of 2011
Use of renewable energy sources (heating)	60 %	95 %
CO ₂ reduction	40 %	> 93 %
Cost savings	30 %	> 30 %



改善



The way of kaizen – small steps to big success



CO₂ emission per year





The green city Freiburg – a synergy of governance, science, and business

Freiburg is said to be Germany's greenest city. The claim is not unfounded – witness its many eco-city projects. It is also home to top research institutes such as the Fraunhofer Institute for Solar Energy Systems (ISE). Pfizer struck up mutually beneficial alliances with the local scientific community. For example, the SIC Solar Info Center and ISE helped plan our buildings and laboratories.

Pfizer Freiburg also brings together the brightest minds from local universities to benefit our business. Graduate students at the local Albert Ludwigs University's Center for Renewable Energy and the University of Applied Sciences in Offenburg helped design our innovative ventilation and air-conditioning systems.

We also support local environmental programs, strengthening our ties to the community. The plant takes part in the Ecofit Program, a joint initiative of the Baden-Württemberg Environmental Ministry, the City of Freiburg, and Arqum GmbH. Experts get together in workshops to consult and develop practical measures aimed to mitigate companies' environmental impact and save costs in the real world. These and many other projects go to show that business concerns and environmental issues go hand in hand.

Stalking the elusive energy opportunity

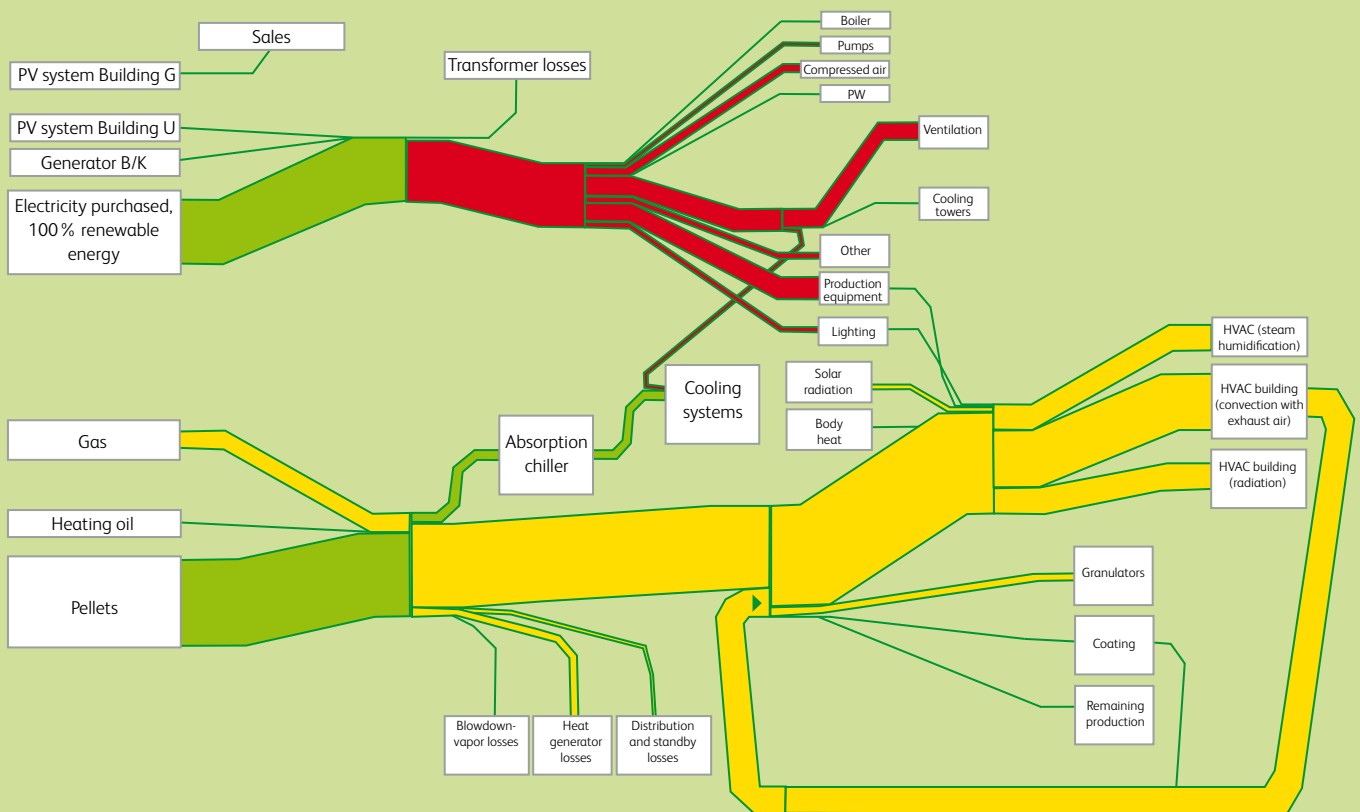
Efforts to coordinate the energy-saving initiatives at the Freiburg facility culminated in our Energy Master Plan. It serves to analyze energy consumed in buildings and by processes, and identify opportunities to conserve energy. We have installed 250 heat, flow, and electricity meters since 2006 to pinpoint untapped savings potential and collect solid data on which to base our decisions. A value-stream chart that tracks all energy flows within the company has proven to be a map to hidden treasure. These measurements are factored into Sankey diagrams that show flow quantities for all our processes at the Freiburg site, providing a sound basis for planning further conservation efforts.

Efficiency first and foremost

The secret to eco-friendly heating and air-conditioning is efficiency. Modern systems powered by innovative technologies outperform their forebears of yesteryear. They provide heat, cold, and compressed air far more efficiently, consuming far less energy. So in 2008, we replaced our air- and process-cooling units with new modular cooling systems that have reduced electricity consumption by one-third. A heat recovery ventilation system is aimed to reduce energy consumption by half. We also decommissioned two of our four steam boilers in 2009, replacing them with a wood pellet-fired boiler.

Out with fossil fuels, in with renewable energy

With Pfizer Freiburg's commitment to renewable energy sources comes peace of mind. We know we are doing a good turn for the environment and that fuel price hikes will not hit us as hard. Biomass fuels the boiler house. Geothermal energy provides heat. A photovoltaic system supplies eco-friendly electricity. And when we need more energy than these systems can provide, we buy it from outside suppliers who source all their energy from hydropower.



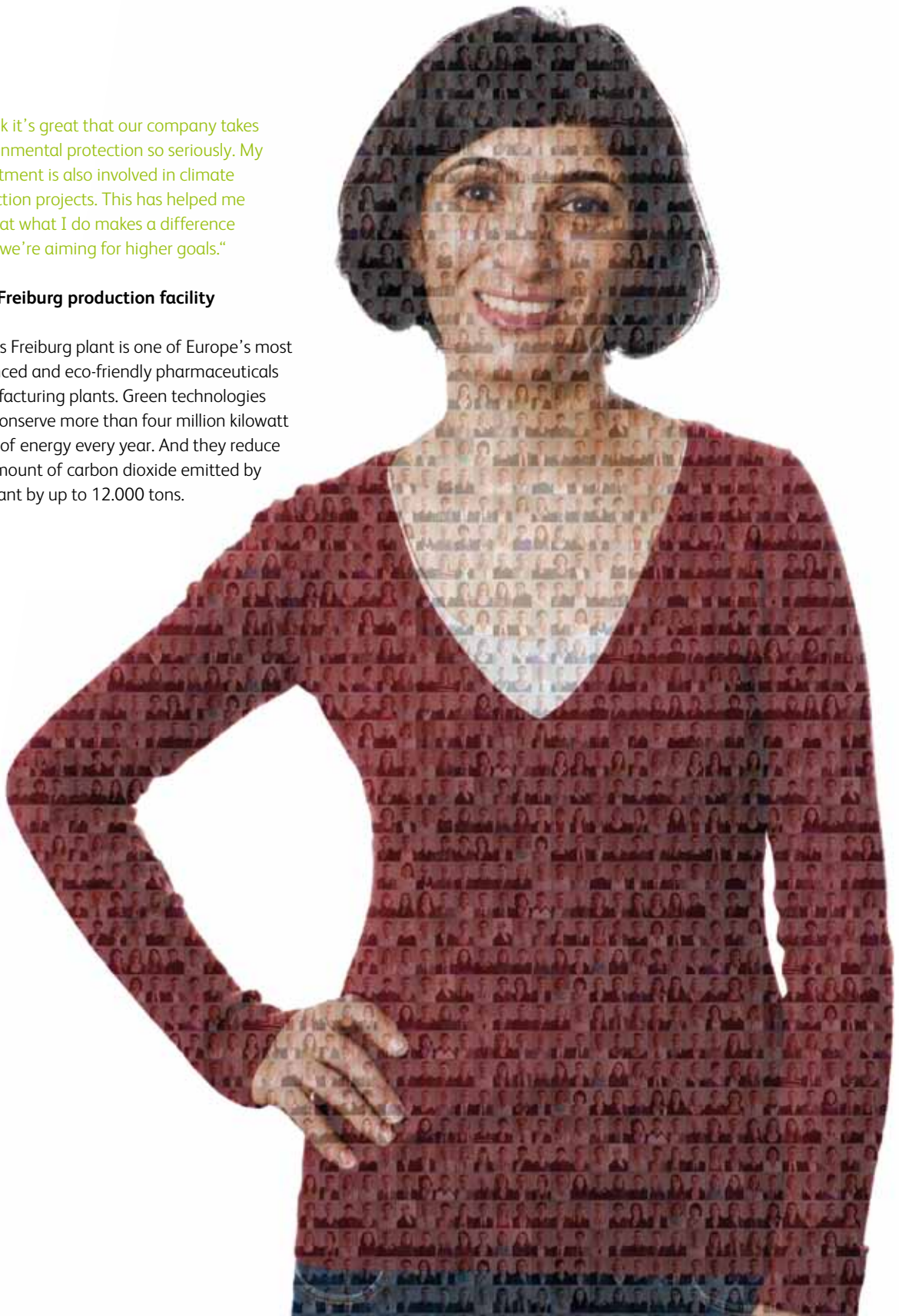
A Sankey diagram is a chart depicting flow quantities in process systems. Unlike in flow-charts, arrows of varying widths represent quantities. The more energy flowing in that direction, the wider the arrow.

Environmental protection begins with me...

“I think it’s great that our company takes environmental protection so seriously. My department is also involved in climate protection projects. This has helped me see that what I do makes a difference when we’re aiming for higher goals.”

Lale, Freiburg production facility

Pfizer’s Freiburg plant is one of Europe’s most advanced and eco-friendly pharmaceuticals manufacturing plants. Green technologies help conserve more than four million kilowatt hours of energy every year. And they reduce the amount of carbon dioxide emitted by the plant by up to 12.000 tons.



Energy Master Plan

Keeping our eyes on the prize

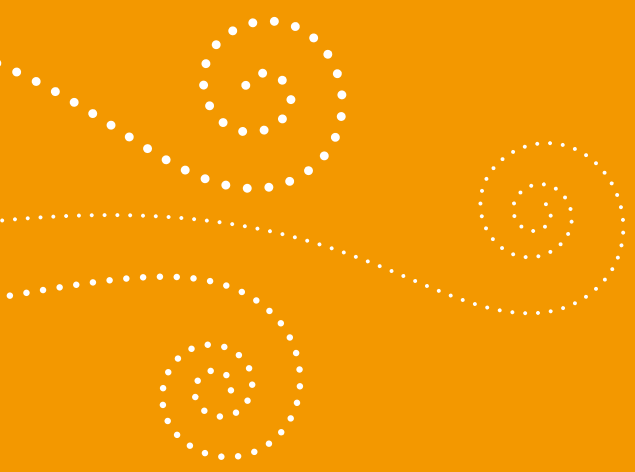
What can a company do to consume less energy? For a major industrial enterprise such as Pfizer, the short answer to this question is: “A lot.” We can analyze our processes with all the tools science puts at our disposal. We can develop sophisticated technologies. And we can change our behavior. If we do all this right, we will release fewer greenhouse gases into the atmosphere. To keep our sights set on this goal, the Freiburg plant put together the Energy Master Plan.

It is a roadmap for implementing more than 250 measures encompassing everything from energy supply and system optimization to employee participation. The plan marshals strengths and methodizes the various initiatives and projects, turning them into an effective tool in the fight against climate change. Every measure contributes, and their collective action mitigates the company’s ecological impact – today and for many tomorrows to come.

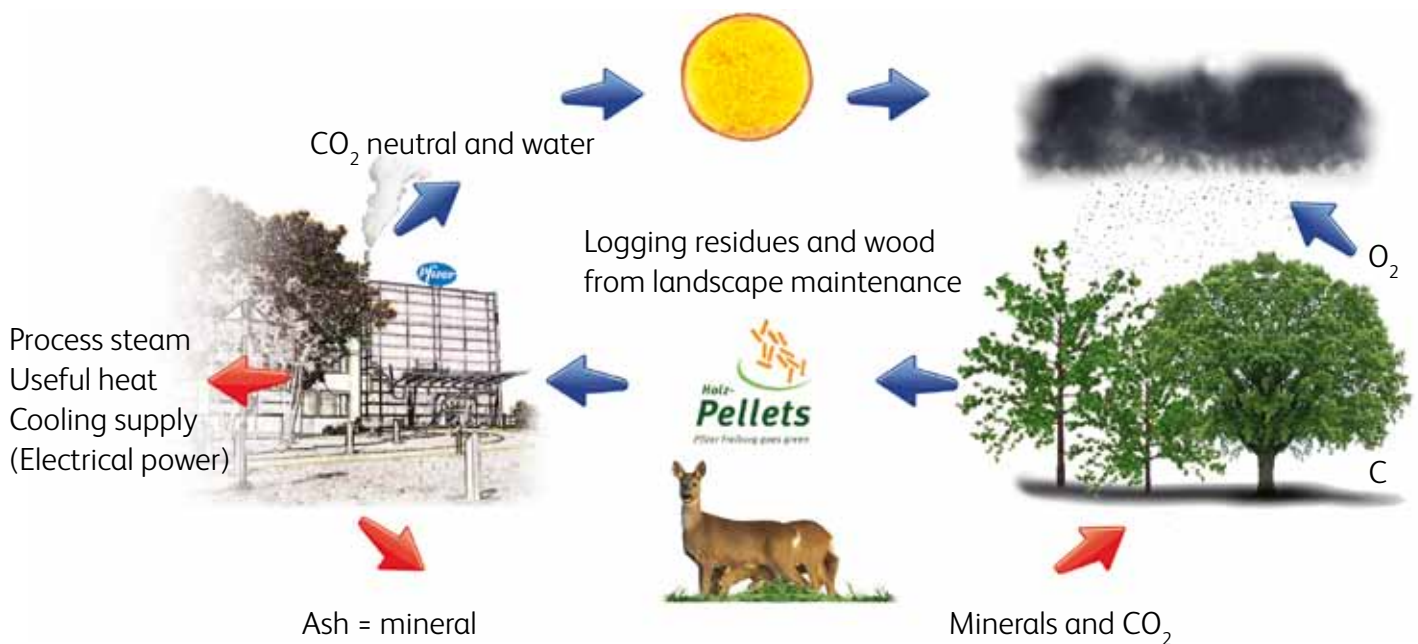
Over the following pages, you will learn more about the incisive changes, bold investments, and ground-breaking projects put into practice by our dedicated workforce. As this account of our environmental efforts unfolds, a picture of Pfizer employees’ drive and determination will emerge. We believe it is a success story well worth sharing.

	The quest for sustainable energy	10
	The case for greener processes and products	18
	Tomorrow’s workplaces today	22
	Advancing the cause of a healthier environment	28
	On the journey for a green future	30

The quest for sustainable energy



Sustainable cycle of biomass





Homegrown eco pellets instead of fossil fuels from afar

Pfizer Freiburg has heated with wood pellets since 2009. Determined to make the leap to this renewable fuel, the company installed Europe's largest pellet-fired boiler. The new climate-friendly system generates heat and steam. The facility reduced its carbon dioxide emissions by roughly 5,500 tons per year by refurbishing and modernizing the boiler house. Now it takes a six-digit figure to put a number on the company's yearly savings in heating costs. Replacing two of four boiler systems of 1962 vintage, the modern wood pellet-fired steam boiler system will cover about 95 percent of the plant's heat and steam needs.

Steam serves to keep the humidity constant and temperatures stable on the production floor to meeting the plant's rigorous standards for indoor climate conditions. And the condensation heat keeps the plant warm and dehumidifies the air. Plans are also in the works for absorption chillers to extract heat from steam to provide cooling.

This energy supply chain is a sustainable closed loop with fuel sourced from right here in our neighborhood. We support the domestic timber industry by sourcing pellets from local plants in the Black Forest that share our commitment to eco-friendly manufacturing practices. The trees are all homegrown in the Freiburg and Rhine Valley region. The combined heat and power generation system uses nothing but untreated biomass sourced from forest plants and trees, agricultural residue, and the timber industry. The factory then converts this biomass into pellets in an environmentally sound and sustainable process.



Visual inspection of the solar modules on the roof of Building G.

Hydropower – an ancient alternative for a brighter future

Our commitment to environmental protection does not end at the company gates. The Freiburg plant sources some of its electricity from an external supplier. Of course, this power is factored into our overall energy equation. According to the Energy Master Plan, electricity generated elsewhere must come from a company offering clean energy. NaturEnergie supplies electricity certified to be generated fully from hydropower. Pfizer Freiburg has been buying electricity from the company since 2010. Hydropower produces no gases harmful to the environment, so this regenerative energy source also spares the environment. This practice of relying on clean energy reduces Pfizer Freiburg's carbon emissions by 4,430 tons annually. Pfizer, as a quantity buyer, also indirectly funds further investments in new hydropower, wind energy, and solar energy facilities. With this kind of commitment to clean energy, the future of green electricity looks bright indeed.

Solar power – CO₂-free and free for the taking

The sun is the ultimate source of energy for all life on Earth, and by far the most important for humankind. It produces more energy in an hour than humans use in an entire year. Germany has become a global leader in the development and use of photovoltaic systems. Located in Germany's sunbelt, Freiburg gets more sunshine than any other city in the country. It has wisely capitalized on this opportunity to become Germany's solar capital and one of the world's greenest cities.

Pfizer Freiburg shares the city's deep commitment to this innovative technology, and our ecological footprint is now much smaller thanks to solar power. Our photovoltaic system spans 105 square meters and delivers 28.4 kilowatts peak output. It produces some 24,500 kilowatt hours per year, reducing carbon emissions by 16.5 tons. The solar electricity generated by the system feeds into the public grids, bringing in another €14,000 in annual revenue. Installed solely by companies in and around Freiburg, the entire system is a local project.



Technical data

Heat pump: 130 kW

19 U-tubes for 130 m

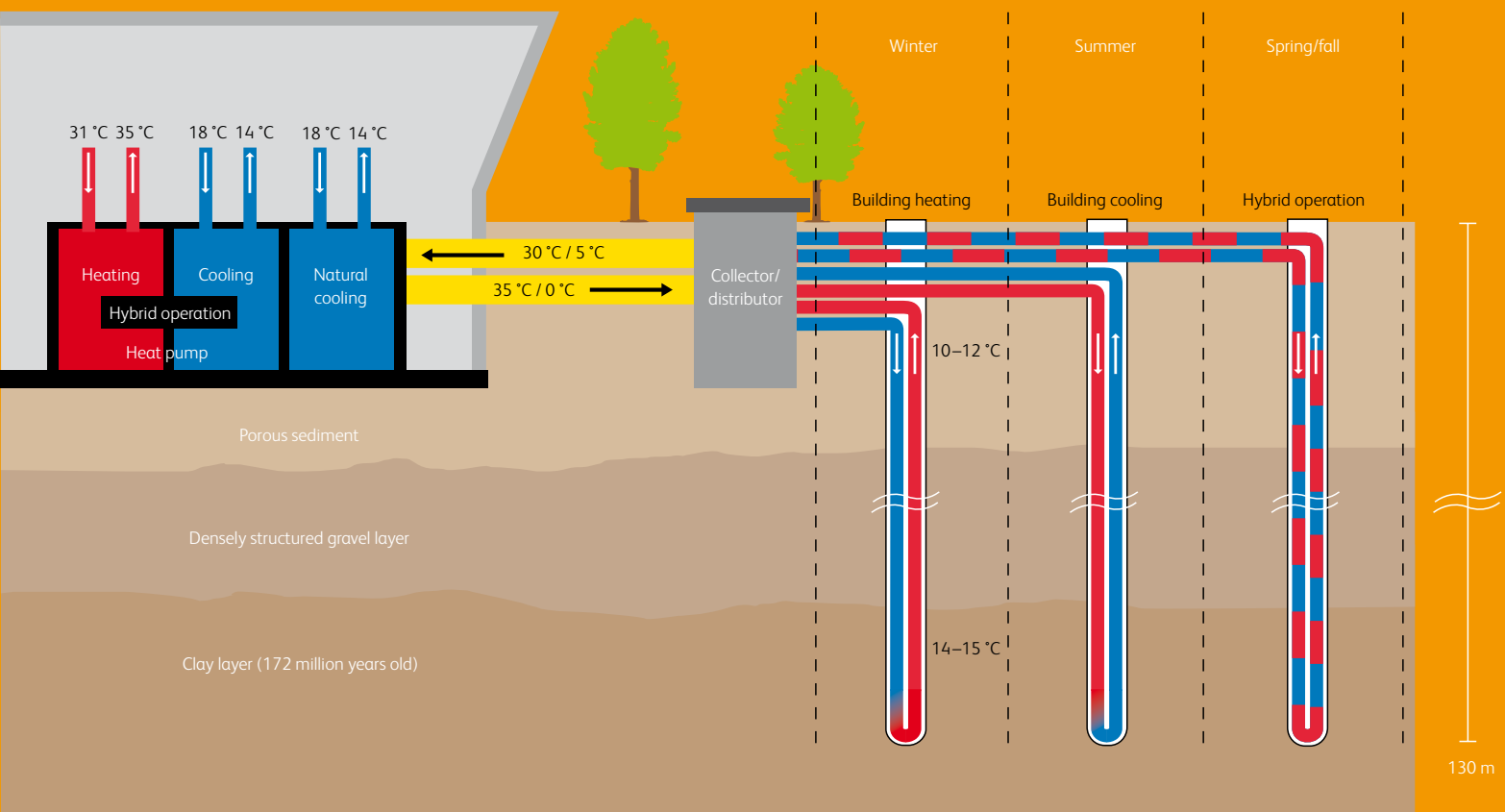
Total length of all pipes: 11 km

8,500 liters of heat transfer liquid

5 kWh of heating or cooling energy is provided by
1 kWh of electrical energy or 10 kWh of cooling energy
when the system is running only with outside air

Cross-section of the borehole
heat exchanger field





Geothermal power – eco-friendly energy from the depths of the earth

Geothermal energy is one of the most cost-effective sources of renewable energy. The return on investments in geothermal power comes fast, and even faster as energy prices rise. It is available year round, regardless of season. And its environmental benefits are persuasive indeed. So Pfizer Freiburg invested in this eco-friendly technology by constructing a large borehole heat exchanger field. Its 19 U-shaped tubes extend 130 meters into the depths of the earth. A water-glycol mixture circulates through these tubes, absorbing heat from down below or discharging it into the earth. In winter, the geothermal system captures heat, extracting it up through the tubes. A 130-kilowatt heat pump raises the temperature to the point necessary for heating. The ground cools in the process. In spring, the building can be cooled fully for extended periods without cooling machines. In summer, the heat pumps' action is reversed. They then serve as cooling machines, drawing heat from the building and directing it back into the ground. The system works very effectively, using just one kilowatt of electricity to generate five kilowatts.

A geothermal energy system is an ideal power source for low-temperature heating systems. Pfizer Freiburg uses such systems to heat floors, walls, and ceilings. Unlike conventional heating units, they do not heat the air in the room, instead delivering heat directly to surfaces and objects. „One great advantage is that these systems are draft-free and silent,“ notes Dr. Jens Pfafferoth from the Fraunhofer Institute for Solar Energy Systems. His research findings show that with radiant heating, the air temperature can be somewhat lower without people in the room experiencing discomfort. The same system keeps temperatures comfortable in summertime. Cold water circulates through the ceiling, cooling rooms by absorbing the heat radiated from surfaces.

We're in this together



Working together for a healthier world: This is our mission, and everyone at Pfizer pitches in to make it happen. Our staff live and breathe the values of the company day in and day out. They come up with innovations large and small. They bring compassion, enthusiasm, and energy to the workplace. And they respect others' ideas. Our workforce's motivation to continue improving what we do and how we do it is a powerful force that impels our company.

Daniela Schöler, production

"Our production has been at the highest technological level for many years. This made it easy for us to respond to the standards of the Asian markets. Through close cooperation and continuous communication, we are able to put complex production requirements into practice."

Nils-Eike Tesch, laboratory

"Our team is highly motivated. Developing the products of the future today is exciting work. We use the latest technologies and testing methods to supply the market with new products reliably, quickly and safely. This makes the Freiburg site a competitive location and it is sure to continue to grow in the future."

Irena Burmeister, packing center

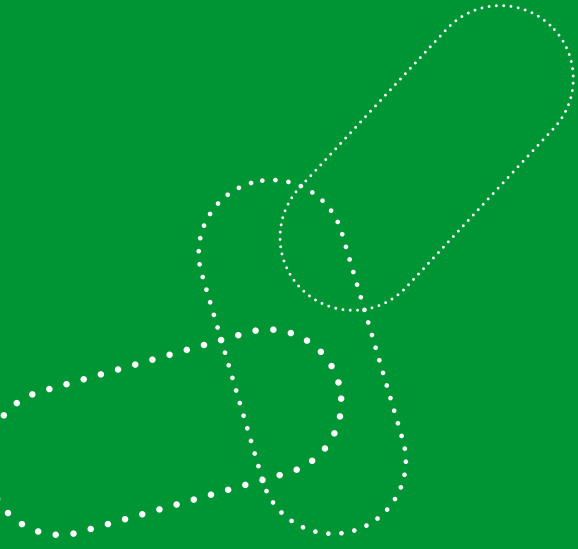
"We supply more than 1,800 products to over 80 countries from our location in Freiburg. Creativity and flexibility are required to reconcile all of the various packaging requirements. An achievement we are very proud of."

Valeri Paul, mechatronics

"We make sure that production runs smoothly. It is extremely important to us that our technology is cutting edge. Ongoing and strategically planned training guarantees that we are always informed about the most recent developments and can integrate them into our plant. We are absolutely convinced of the benefits of this strategy."



The case for greener processes and products





A cleaner way to go in pharmaceuticals

Opportunities to protect the environment are there for the taking in pharmaceuticals manufacturing. For example, Pfizer has eagerly adopted the practices of green chemistry. Now when Pfizer Freiburg develops new medicines, we strive to formulate tablets and capsules so they can be produced without water and carrier substances called excipients. Another example is our method of roller compaction for dry granulation. This eco-friendly technology reduces hazardous waste. We also collect rinse and wastewater separately so it can be neutralized and disposed of properly.

Green inside and out

Green medicines deserve green packaging. So Pfizer is seeking better ways to use sustainable resources for all our products' packaging. A team of experts has been tasked to develop new practices to minimize packaging material. A beneficial side-effect: Less packaging means lighter, smaller shipping loads. Staffed with people from around the globe, the Sustainable Packaging Development team is headed up at Freiburg. It collects promising ideas, lessons learned, and best practices from all our production sites to devise a unified global strategy.

This team has already made strides. The cardboard containers used to transport products have been standardized, reducing their number from 50 to 2. The switch to recycled materials for product packaging has succeeded. We now use recycled cardboard made of lightly treated material for pharmaceuticals packaging, as well as very thin PVC film in aluminum foils. This practice has been held up as an example for other sites to emulate.



The eco school of cooling

Three new quantum chillers for our labs – two with 1,200 kilowatts cooling capacity, and one with 850 kilowatts – produce the cold air we need for process cooling, air-conditioning, and dehumidification. Engineered to save energy, cut costs, and spare the environment, they are powered by speed-controlled radial turbo-compressors. Their drive shafts feature magnetic bearings, so rotating parts do not wear. The chillers automatically adjust their output to match current cooling requirements. They operate most efficiently at less than peak capacity, where they also generate less heat and need less cooling. The energy savings are tremendous, which of course drives down operating costs.

A continuously variable speed controller adjusts output to satisfy varying power demand. Individual compressors are tuned to switch on and off at the most opportune moment. They start up gradually and sequentially to minimize power grid fluctuations. The quantum chillers run quietly and smoothly.

From hot to cold and back again

In winter, humidifiers and heaters consume the most energy; in summer, the cooling systems have the biggest appetite for power. Now that we use eco-friendly biomass to generate heat, the next big step towards carbon neutrality at the site is finding a green alternative for cooling.

Our plant's future looks even greener as the day approaches when we can tap the full potential of the pellet-fired boiler. It burns at least 200 to 300kg of fuel per hour, so it remains dormant in the warmer months. We simply do not need that much extra heat in summer. However, we do need cold water for air-conditioning when temperatures soar. Our electricity consumption spikes during the summer, and we have been using a diesel generator to help satisfy peak demand for power.

Once we replace two of the ammonia cooling units in place today, we will be able to use steam from the pellet-fired boiler to produce cold air. We aim to meet 80 percent of our cooling needs with a new, highly efficient lithium bromide absorption chiller. To date, we have used biomass to generate around 85 percent of the steam we need. With the new absorption chiller, this figure will rise to about 90 percent. What's more, we hope to reduce annual electricity consumption from 2,800 to 280 megawatt hours.



Tomorrow's workplaces today





Flooding the workplace with natural light saves energy and puts a warm and welcoming touch on large, open-plan offices.

Flexible interiors, eco-friendly architecture

In pharmaceuticals, like in life, the only constant is change. We often have to start afresh with entirely new teams, new labs, and new workflows to develop and manufacture new products. So our offices and labs have to be extraordinarily flexible. Speed is of the essence: We must be able to adapt these spaces quickly to meet emerging needs. After all, the competition never rests.

The answer to this architectural dilemma is the mix-and-match interior. Our rooms, fixtures, and furnishings may be combined and recombined like Lego bricks. With modular and versatile elements, remodeling is an exercise in speed and convenience. Cooling, heating, and ventilation ducts run through the ceilings, out of sight and out of the way. There are no heating units to consider when reconfiguring a room. Electrical switches, sockets, and fume hoods are portable. An ingenious mounting system lets us reposition these fixtures on lab walls as we see fit. Rooms are easily refurbished without construction work. They are ready to accommodate new projects in a scant few days.

A building must be designed for very long use to be truly sustainable. Ours at the Freiburg site certainly are: They won the Green Building Award in 2007, a distinction bestowed within the Pfizer Group in recognition of sustainable building design.



Energy-conserving architecture

Our buildings walls, ceilings, floor plans, and other architectural elements are designed to boost energy efficiency.

The ceilings cool, heat, and help control the building's climate. And they do this at low temperatures, further enhancing our geothermal energy system's efficiency. The warmth and coolness radiating from the ceilings is not trapped in enclosed spaces. Instead, it can circulate freely in the large open spaces of our versatile open-plan offices, thereby saving energy. Very few of our offices are enclosed, and only then when absolutely necessary.

Glass partitions make it so much easier for our staff to communicate. They also allow natural light to flood the hallways. This creates a warm and inviting atmosphere, and saves electricity otherwise used for artificial lighting. And the artificial lighting that we do use is very flexible. It is easily adjusted to suit each workplace in open-plan offices, for example, brighter for lab work and dimmer for computer tasks. Everyone can adjust the lighting for their workstations as they see fit.

Blinds block out solar heat. The outdoor shades are particularly effective. They prevent the heat of the summer sun from entering the building so less energy is needed for cooling. However, they do reflect the sun's rays under the ceiling to bathe the workplace in natural light. Light sensors control the artificial lighting, temperature, and blinds. All this makes the climate in each work area very comfortable indeed.



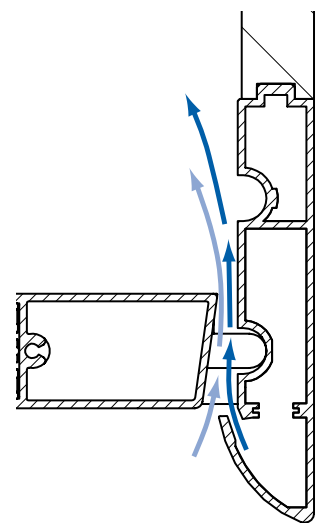


Enhancing comfort and safety with innovative technology

Quality standards for pharmaceutical products are stringent. It takes state-of-the-art labs and equipment to live up to these exacting demands. But advanced automated technologies have a voracious appetite for energy. Take, for example, a standard lab fume hood: In continuous operation, it consumes about as much energy per year as a single-family home. This is why we installed modern Secuflow® fume hoods in the Pfizer Freiburg laboratories. Far more efficient at circulating incoming and outgoing air, they require two-thirds less air than conventional fume hoods. The less air that flows, the less energy is consumed, and the more cost-effective the fume hoods are to operate. In the final reckoning, this makes our labs more profitable.

Secuflow® fume hoods offer innovative features that conserve resources:

- A laminar flow layer above the workstation draws in heavy gases, so there is no need to generate a large flow across the entire inlet.
- A motion detector automatically prompts the sliding window to close when no one is working.
- The volume of flow is reduced, and the air exchange rate may be decreased from 8 to 4 at night.
- Waste may be funneled directly from the workstation to a built-in tank.
- The system may be arrayed and configured flexibly using innovative modular elements.



Secuflow® fume hoods: cross section through the sash and side post. This channel is shaped to accelerate ambient air flow without compromising splash protection.



The advanced art of adiabatic cooling

The DEVCON building stands as a shining example of innovation at the Freiburg site. Home to a special unit that handles very powerful agents, it has to meet rigorous work safety standards. Never before has a laboratory building with such exacting air-conditioning and ventilation requirements been equipped with adiabatic (evaporative) cooling technology. Undeterred, we tasked engineers to develop a novel air-conditioning concept.

Now our eco-friendly adiabatic cooling system uses water vapor to help conventional compressors cool the air in offices and laboratories. One cubic meter of water per day is enough to cool 1,000 square meters of office space. First the exhaust air is humidified to allow its energy to be harvested. Then a heat exchanger releases the resulting cold air into the room. Trials with the pilot system proved successful, so we also put this technology to work in our SPRING building. Temperatures in both buildings remain comfortable even on the hottest summer days.

Energy-efficient products and processes from day one

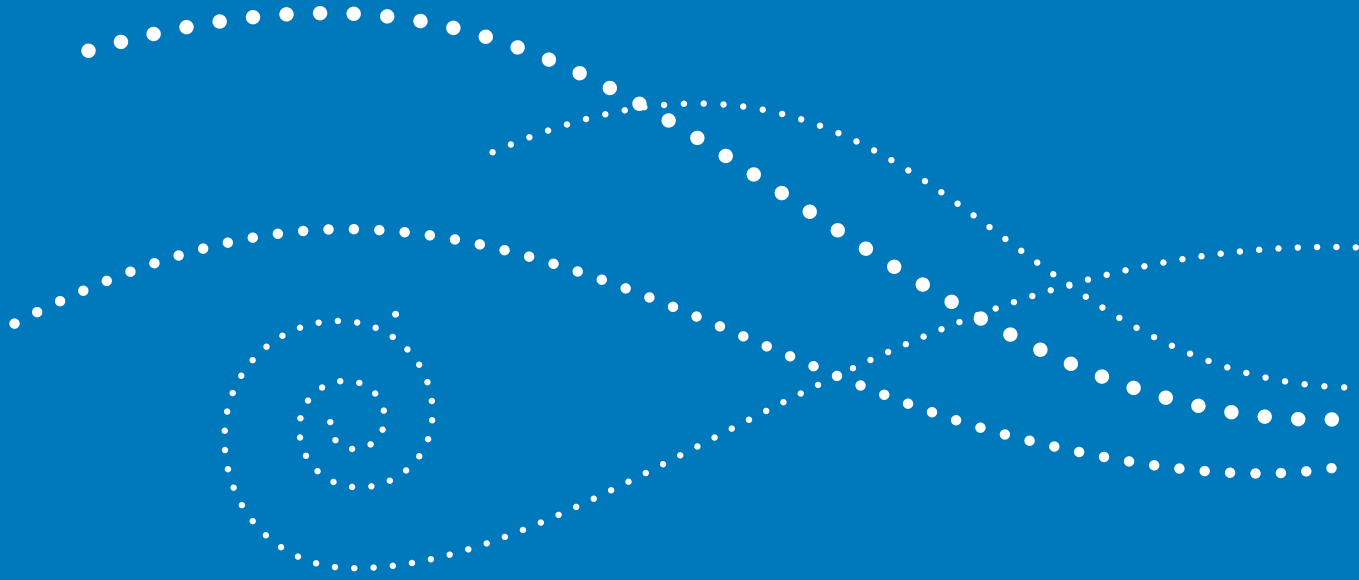
Pfizer is committed to designing eco-friendly and energy-efficient processes and manufacturing methods – right from the inception phase of product development. Our product and process development unit has been tasked to test and deploy energy-saving air-conditioning and ventilation technologies such as adiabatic cooling and solar-powered air treatment systems. These efforts are paving the way for new technologies in production.

Nurturing our strong ties with the scientific community, Pfizer Freiburg collaborates with the city's academic institutes, including the Fraunhofer Institute for Solar Energy Systems and the network of local universities aligned with the Center for Renewable Energy. These assets have been pooled in pursuit of a common cause – to develop technology and methods that spare resources. Of course, to identify conservation opportunities and design efficient manufacturing processes, we first have to monitor our energy consumption.

When Pfizer Freiburg set out on this green journey, we did so with the support of an integrated product and process development unit and a holistic outlook on our products' lifecycles. Now this integrated R&D environment provides the perfect proving ground for new, greener technologies.



Advancing the cause of a healthier environment



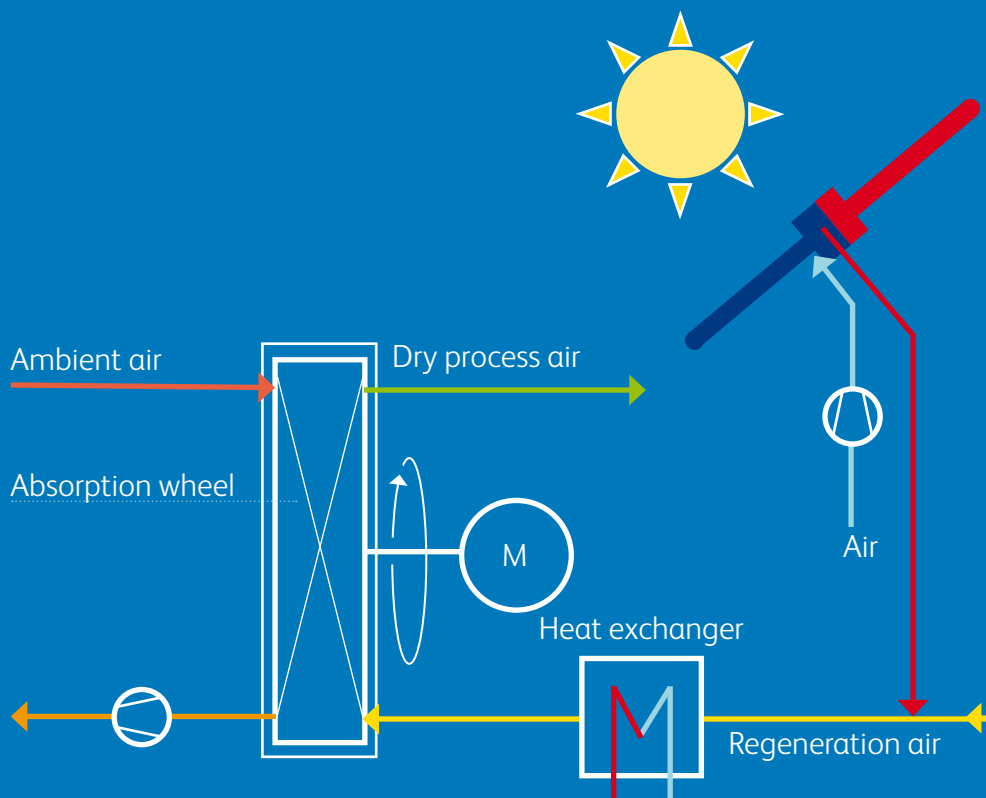
STAR – a stellar source of dry air

Pfizer Freiburg is breaking new ground in energy supply and climate control technologies, as the many success stories above attest. Another stellar example is the aptly named STAR project. Short for Solar Technologies applied to Absorption wheels Regeneration, this is an innovative energy conservation initiative launched jointly with the Center for Renewable Energy at Freiburg's Albert Ludwigs University and Offenburg's University of Applied Sciences.

Some of the plant's production facilities require very dry air. To provide it, we regulate humidity using 33 dehumidification systems of various sizes. The steam from the new pellet-fired boiler powers 13 dryers; another 20 run on electricity. These electric dryers present another excellent opportunity to downsize our environmental footprint. So we joined forces with our research and university partners to develop technologies that will ultimately curtail energy consumption and carbon emissions.

The outcome of these efforts is a cost-efficient and energy-saving solution that taps the sun's radiant heat. Covering a surface area of about 120 square meters, the pilot system's evacuated tube solar collectors preheat the air destined for an absorption wheel's regeneration air stream. Someday soon, the sun will take over the job from electric dryers that consumed so much costly electricity.

Developed by Kollektorfabrik in Freiburg, the pilot system reduces energy consumption by as much as 50 percent. Designed to work without liquids or phase changes, it is lightweight and requires almost no maintenance. We aim to convert all our electric dryers to this far more eco-friendly system as soon as the trials have been successfully completed.

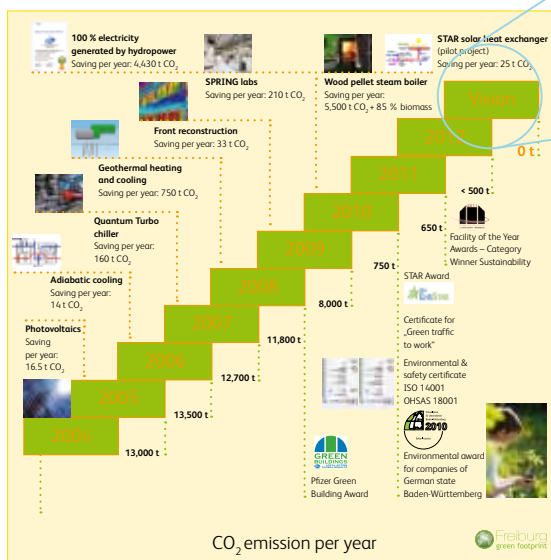
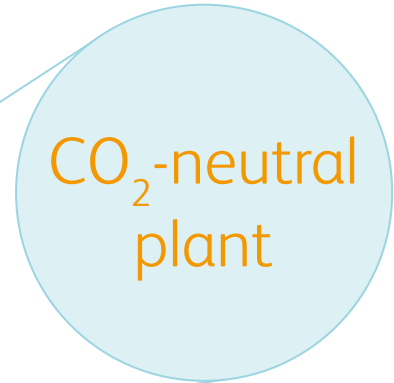


On the journey for a green future



Vision 2020

Pfizer Freiburg has reached many milestones and explored new frontiers on its green journey. But we still have a long way to go to our destination. Major strides await on our path to a greener tomorrow.



The road ahead

Pfizer Freiburg has slashed CO₂ emissions with projects large and small. The day is nearing when the plant will achieve carbon neutrality. Our workforce has, since 2005, proposed more than 200 measures to save energy and boost efficiency. Their efforts have helped reduce annual carbon emissions by more than 12,000 tons. And our five-member SECON (Site Energy Conservation Team) continues to collect suggestions.

Pfizer employees at Freiburg have championed the idea of climate protection in recent years. Employees scoot around the plant grounds in solar-powered cars. Many show their true environmental colors by cycling to work. Trainees learn to value our precious resources and take responsibility for their actions. Our highly motivated personnel are keen to seize every opportunity for environmental improvements at the workplace. One employee's can-do attitude and infectious enthusiasm inspires the next, sparking a chain reaction of initiatives throughout the company. And we are always eager to forge new alliances with outside experts.

A cleaner way to dry

Solar thermal technology looms large on the horizon. In view of how much energy the Freiburg plant expends to dehumidify process air, the global industry's expenditure is surely astronomical. This is why we have partnered with Offenburg's University of Applied Sciences to monitor closely the first solar air drying system at the Freiburg site. Offenburg University has kindly shared its expertise in process monitoring, helping us to track the solar energy system's performance. Once we validate its efficiency and sustainability, we aim to equip our remaining electric dryers with evacuated solar collectors. This shift from electrical power to solar thermal technology will further reduce energy consumption and carbon emissions.

Sustainable climate in storage and shipping

Reasoning that what's good for production areas is good for storage, we started looking into green warehousing technologies. Storage areas have high ceilings and wide open spaces containing a vast amount of air, but not a lot of room for error when it comes to climate control. This takes a great deal of energy, which prompted us to test various solar-powered absorption cooling and dehumidification systems. Using computer-assisted models and simulations, we are assessing how well they perform and what specifications will further the reciprocal causes of sustainability and cost efficiency. This project aims to combine the sustainable energy sources we have now with further green technology.

Greener packaging, cleaner plant

Lighter packaging material will contribute to even more CO₂ reductions at the Freiburg site. Tests performed on the packaging line are telling us what we can do to mitigate packaging materials' environmental impact. New materials that consume fewer resources are already on the drawing board for many products.

Pfizer Freiburg –
climate neutrality
is within our reach.



Recycling station

STAR project

Bioenergy: wood
pellet-fired system

Bike station

Green product and
process development

Green production

Green laboratories

Geothermal field

Solar roofs

Energy-efficient building

We wish to thank all our fellow travelers for their support on our green journey:

Dr. Kirsten Lund-Jurgensen, Vice President Primary Care & Oncology,
Pfizer Global Supply
Dr. Dieter Salomon, mayor of the city of Freiburg
Uwe Ladenburger, FWTM Freiburger Wirtschaft, Touristik und
Messegesellschaft
Prof. G. Oesten, ZEE Center for Renewable Energy
Prof. Elmar Bollin, Offenburg University of Applied Sciences
Prof. Rolf Buschmann, Ened International Education Center for Energy
Dr. Jörg Grotefendt, SEGU
Herbert Dold, Dold Holzwerke
Dr. Jens Borchers, Forst Fürst zu Fürstenberg
Per Klabundt, Gesellschaft 100 %
Dr. Ulrich Kaier, ECH Energie Contracting Heidelberg
Joachim Badyła, Cofely
Thorsten Siems, Kollektorfabrik
Stefan Holler, Waldner Laboreinrichtungen GmbH&Co.KG
Holger Konrad, Architekturbüro Fay
Walther Reinhard, Büro Reinhard
Dieter Emmenecker, Axel Kleusch, Andreas Rapp, Pfizer Freiburg
All employees at the Freiburg site

And all those we have not mentioned here.
Environmental protection is teamwork!

Publication information Pfizer
Pfizer Manufacturing Deutschland GmbH
Mooswaldallee 1
79090 Freiburg, Germany
Tel.: 0761/518-0
Fax: 0761/51877-3070
www.pfizer.de

Editing: Solar Consulting GmbH, Freiburg
Layout, typesetting, printing: netsyn, Freiburg
Printed on CircleSilk premium white paper certified by the eco-label of the
European Community (Reg.no. FR/11/003).

All rights reserved. Permission required for reprinting.
©Pfizer Manufacturing Deutschland GmbH
Freiburg 2011

Image credits: The page number that the photo or graphic appears on
is provided. We thank the companies listed for giving their consent to
reprint the following.

Aufwind: 32; Bernd Maurer Imagesysteme: 15; Fotolia: 4, 13;
Fototeam Vollmer: 1, 2, 6, 11, 12, 14, 18–28;
netsyn: 5, 10 (graphic), 29 (graphic), 30 (graphic);
Pfizer: cover, 5, 7, 8, 15, 26, 29, 30, Waldner: 25 (graphic)



**Pfizer Manufacturing
Deutschland GmbH**
Mooswaldallee 1
79090 Freiburg, Germany
Tel.: 0761/518-0
Fax: 0761/51877-3070
www.pfizer.de