Green Industry Park Freiburg

INCL. INTERVIEW WITH CLAUDIA KEMFERT

PIONEERS. TOGETHER.

[Green Industry Park]

Freiburg IM BREISGAU

Fraunhofer ISE

IHK Südlicher Oberrhein

badenova Energie. Tag für Tag

Management Marketing FWTM FREIBURG

Joining forces, implementing ideas

The partners of the Green Industry Park Freiburg Initiative

City of Freiburg

The City of Freiburg Environmental Protection Office coordinates the activities of the Green Industry Park Freiburg (GIP) initiative and, together with its partners, is driving the project forward. In accordance with municipal law, the city may not provide its own subsidies to companies. The City of Freiburg therefore supports the development process through networking, tailored seminars, implementation workshops and the provision of expert advice. The expansion of the bicycle path infrastructure and the implementation of two bus lines in the GIP Nord demonstrate its concrete commitment to the area.

badenova

As a regional energy supplier, **badenova** was part of the initiative from the very beginning. The company has been an active player in the energy revolution for many years. It contributes to the implementation of the Green Industry Park objectives through climate-neutral administration buildings or the implementation of PV systems on green roofs. The heat pipeline from Cerdia to the new exhibition centre and the SC Freiburg stadium is a key investment for climate-friendly heat supply in the GIP

The Fraunhofer ISE

The Freiburg-based **Fraunhofer Institute for Solar Energy Systems** is the largest solar research institute in Europe. It researches and develops technologies for an efficient and environmentally friendly energy supply and implements climate neutrality demo projects in companies, districts and cities. The Fraunhofer ISE brings technological innovation and a spirit of research to the initiative

FWTM

Marketing, communication and networking are one of the main tasks of the Wirtschaftsförderung Freiburg – **FWTM** (Freiburg economic development agency). The FWTM contributes its expertise to making the Green Industry Park Freiburg visible and to establishing it as part of the Green City. Its good connections with local companies have provided access and has ensured trust in the Green Industry Park Freiburg initiative since the outset.

IHK Südlicher Oberrhein

The **IHK Südlicher Oberrhein** (Southern Upper Rhine Chamber of Commerce and Industry) is the latest member to join the Green Industry Park initiative. Its goal is to support companies in getting "fit" for the transformative challenge of climate neutrality. The Green Industry Park Freiburg is a good setting for this. The IHK contributes its further education structures and networks, as well as its know-how in the fields of innovation and corporate environmental and climate protection.

Klimapartner Oberrhein (Upper Rhine climate partners) and **ITG mbH & Co. KG** provide expert support for the Green Industry Park initiative. Both contribute their knowledge of current funding opportunities, contacts and experience in the field of energy and climate protection as well as in the field of "connected industry" ("Vernetzte Industrie"). In addition, they are looking at hydrogen as a possible future energy source in the region.

Green Industry Park Freiburg

"Together for more energy and resource efficiency in industry and commerce"

An initiative by:

Freiburg im Breisgau · badenova Energie. Tag für Tag · Fraunhofer ISE · Management Marketing FWTM Freiburg · IHK Südlicher Oberrhein

Martin W. W. Horn
Lord Mayor
City of Freiburg
in Breisgau

Christine Buchheit
Mayor for the
Environment, Youth,
Schools and Education

Dear business owners, dear readers,

the award won by the Green Industry Park Freiburg initiative in 2018 was a statement of national recognition of a bold and innovative pioneering achievement: the development of an existing industrial area with more than 400 companies towards climate neutrality; no city in Germany had dared to do this before.

It was clear that this can only be achieved in collaboration with the businesses in the area. The Green Industry Park initiative, or GIP for short, has consistently followed this approach: it relies on the company's own know-how, on concrete knowledge sharing and on making successes visible. It wants to encourage, motivate and network. The local companies particularly appreciate the networking possibilities and wish for it to continue to be strengthened in the future, according to a survey.

At the same time, the City of Freiburg has sent its own signal and made it very clear for everyone in the area that a change in the general conditions is important in order to achieve climate goals. For example, using funding from the city's Climate Protection Fund, new bicycle paths were created on Hans-Bunte-Strasse. Additionally, two VAG bus lines have been established, which make commuting to work more environmentally friendly. In collaboration with Cerdia, badenovaWÄRMEPLUS has successfully established a district heating grid that carries environmentally friendly waste heat from production processes via the Märtin car dealership, the Neue Messe exhibition centre and the Fraunhofer Institute (IPM) to the new SC stadium. This saves around 900 tons of CO_2 a year.

Numerous local companies have introduced energy management systems, replaced boilers and cooling systems, switched their lighting to LED, built solar systems for self-supply on the roofs of their businesses or are in the process of restructuring their vehicle fleet. The climate targets at the EU, federal and state level provide the framework. Though the city does not always agree that they are sufficiently far-reaching and ambitious. Freiburg will not succeed in becoming a climate-neutral city without the gradual conversion to climate-friendly and low-carbon production. In short: a Green City needs green industry.

Following the successes in the Industrial Area Nord, a second process was started to turn the Hochdorf industrial area into a Green Industry Park and, this year, a climate protection sub-concept was developed with the involvement of local businesses. The first measures are already being implemented.

We would like to thank all business owners and employees in the companies for their commitment, whether in the field of energy and resource efficiency, sustainable mobility management or a renewable energy supply. Together with our partners in the Green Industry Park Freiburg initiative, Freiburg Wirtschaft Touristik und Messe (FWTM), badenova, the Fraunhofer Institute for Solar Energy Systems and, from this year, also the Chamber of Industry and Commerce, we will continue to support the companies in reaching their "Made in Freiburg" climate goals.

Martin W. W. Horn
Lord Mayor

Christine Buchheit
Mayor for the Environment

An interim review

The idea of developing the Industrial Area Nord into a sustainable, resource and energy-efficient production location was conceived in February 2014. The City of Freiburg (Environmental Protection Agency), the energy service provider badenova AG & Co KG, the Fraunhofer ISE and the municipal economic development agency FWTM had joined forces to establish the Green Industry Park Freiburg initiative and developed a new approach: on the basis of extensive data collection, a climate protection sub-concept was developed for an industrial area for the first time in Germany.

The Industrial Area Nord is the oldest and largest industrial and commercial area in Freiburg. The 500 companies based in the 300 hectare area employ around 15,000 people. An important finding from the analysis of the situation at the time: 20 percent of the electricity in Freiburg is consumed in the Industrial Area Nord. This accounts for one tenth of the CO_2 emissions in Freiburg. 90 measures in the fields of energy efficiency, energy management, renewable energies, mobility and public relations were developed in collaboration with local companies as part of the climate protection sub-concept, of which 20 were assigned high priority.

Workshops were held regularly between 2014 and 2021, covering a wide range of topics: from energy management/energy audits, exploitation of waste heat, cooling and climate control, energy-efficient production facilities and buildings to green IT, commuter mobility, small-scale logistics, the recycling economy, blooming industrial areas or, more recently, the CO_2 tax. Regular annual events were used to make successes visible and to keep the spotlight on climate protection as a challenge for businesses. Networking and the establishment of strong personal contacts and mutual trust also played an important role.

The implementation of a waste heat pipeline from the Cerdia production site (formerly Rhodia) through the Messe Freiburg (exhibition center) to the new SC stadium was a key measure for the reduction of CO_2 emissions: badenovaWÄRMEPLUS and Cerdia supply more than 5,000 kW of environmentally friendly process waste heat to a growing number of consumers. As a result, a total of 920 tons of CO_2 is saved every year.

Numerous other measures have been implemented alongside the district heating grid: they show that innovation and investment in measures to reduce consumption and climate-friendly measures and processes play a role in an increasing number of companies. Even though security of supply for heat and electricity and the economic efficiency of measures

in an industrial context are of crucial importance. Dynamic CO_2 pricing, which entered into force in 2021, will also redefine future economic limits.

The Green Industry Park project has attracted nationwide attention and was one of the winners in the 2018 "Klimaaktive Kommune" (Climate Active Municipality) competition, held by the Federal Ministry for the Environment and the German Institute of Urban Affairs. Since 2019, work has been underway to develop a second Green Industry Park by applying the concept to a second industrial area: Hochdorf.

Strategy and further prospects

The Green Industry Park Freiburg initiative has become a programme framework for climate protection in companies and has developed into a valued networking platform. Committed companies have become driving forces, regular workshops, including factory tours at innovative neighbouring businesses, have multiplied ideas and established contacts. The City of Freiburg has built new bicycle paths and, together with the VAG, established two well-received bus lines in order to create concrete offering for climate-friendly commuter mobility in the industrial area.

A recent survey of local companies shows that the Green Industry Park as a location factor still plays a secondary role in business decisions. At the same time, however, the location of Freiburg as a Green City is a welcome communication factor. The Green Industry Park brand should therefore be strengthened further in the future. The political objective of an economy that is both climate-neutral and competitive, as formulated by the EU in the 2020 "Green Deal", will drive the sustainable transformation of the industrial landscape and itself become an economic factor. This innovative challenge of creating a climate-neutral production landscape is also on the agenda for the IHK Südlicher Oberrhein (Southern Upper Rhine Chamber of Commerce and Industry), which is why it became a member of the GIP initiative in April 2021.

With the Federal Constitutional Court decision of May 2021, the government is obliged, in the interests of generational justice, to define stricter reduction targets and concrete implementation steps for the period after 2030. This results in reliable framework conditions for companies and businesses that create planning and investment security and fair competition for the best climate-neutral solutions.

The time is therefore ripe for the Green Industry Park to enter a new phase. With all the successes, there is still plenty of potential in the GIP, which must be realised together. Clean energy, electricity and heat supply with as little CO_2 as possible and resource efficiency, as well as sustainable mobility and appropriate compensation models contribute to climate neutrality as an overarching goal. The GIP strategy of supporting businesses in the Green Industry Park Freiburg in achieving their respective efficiency and climate goals continues.

The resulting network will be further strengthened and become a platform for exploring best ideas, networked solutions and measures which are ready for implementation. Practical routes to climate neutrality are demonstrated and the exchange of technical expertise continues. It is important for workshop offerings to continue to meet the needs of companies and to create agile formats as required in order to make use of opportunities for action and funding opportunities that present themselves on short notice. A redesigned website supports interaction within the GIP with its portfolio and offers an attractive communication platform on which companies are able to present themselves with their practical innovations and communicate with one another. Flagship projects both large and small are made visible and the Green Industry Park brand is strengthened. It is planned that SMEs will be more involved in the GIP process in the future than ever before.

Freiburg
IM BREISGAU

EXAMPLES OF MUNICIPAL MEASURES

- Establishment of the Climate Protection Fund
- Bicycle path expansion (Hans-Bunte-Strasse)
- New bus line 23, greater frequency of line 24 (City of Freiburg/VAG)
- PV system at the new fire station (Tullastrasse)
- Green Industry Park Climate Manager
- Networking, workshops, events
- Mediation of counselling/funding opportunities

Heat supply and cooling

The numbers serve to locate the companies and projects on the overview maps p. 10/11 and p. 17.

Projects & implementation examples

1 DISTRICT HEATING GRID CERDIA, badenova

One major project within the Green Industry Park is the use of industrial waste heat for a local supply system. The idea of a waste heat grid in the neighbourhood could be implemented due to the urban developments in the exhibition centre and airport area. Existing facilities and newly planned buildings have been using the available industrial waste heat from Cerdia since 2018 – conventional central heating systems and the use of fossil fuels are therefore no longer necessary. In addition to supplying the exhibition centre, the new FWTM administration building, the new SC Freiburg stadium and the Märtin car dealership with heat, the system also offers emission-free heat supply for other customers.

Klaus Preiser, Managing Director of badenovaWÄRME*PLUS*

"As long as climate neutrality has not been achieved, we at the Green Industry Park have not yet reached our goal. As Green City Freiburg, we must aspire to be faster than others."

2 BIOTECHPARK Freiburg: New cooling system

The BioTechPark Freiburg cooling plant, which was commissioned at the end of 2018, serves as a reference project within the Green Industry Park Freiburg initiative. The concept for the energy-efficient and economical cooling envisages the use of scroll compressors, combined with innovative and sustainable adiabatic recooling of the cooling circuit using heat exchangers and condensers on the roof of the building – instead of the existing open wet cooling or cooling tower. Potential savings of 50 percent or up to 100 tons of CO_2 were assumed for the cooling demand in comparison with the old plant, based on previous consumption values and with a view to future users. In addition, measures have been implemented to optimise the air volume in the vicinity of the main ventilation system, which additionally contribute to improving energy efficiency.

3 RETERRA: biogas plant

The RETERRA bio-waste fermentation plant processes around 45,000 tons of bio-waste from Freiburg, Breisgau-Hochschwarzwald and parts of the Lörrach district every year to generate renewable energy. The biogas produced there – mixed with landfill gas from the former Eichelbuck landfill – is fed via a gas pipeline to a cogeneration plant (CHP) in the Landwasser district. This plant supplies around 4,900 households with electricity for one year and about 1,200 households with heat. Part of the biogas is used for internal supply. The fermentation products from this process are turned into compost and high-quality fertilisers. These replace commercial fertilisers and conserve raw material resources in regional agriculture.

4 AUTOHAUS MÄRTIN: CO_2-neutral building

The Märtin car dealership is working towards more climate protection also outside of mobility: the new building on Hermann-Mitsch-Strasse draws its heat from the Cerdia district heating grid and generates electricity using its own photovoltaic system. Thermal concrete core activation serves as an innovative and cost-effective method of cooling and heating the building. This is done by making use of the ability of the ceilings and walls in the building to store thermal energy and thus to heat or cool rooms.

5 New BADENOVA building: Concrete core activation plus DGNB Platinum award

Regional energy and environmental service provider badenova's newest office building achieved the highest category with the "Platinum Award" from the German Sustainable Building Council (DGNB). The result came in shortly before the turn of the year 2020/21: With a fulfilment rate of 86.8 percent, badenova was even able to top the result for the last building, which achieved 82.5 percent.

6 SOLAR INFO CENTER

The Solar Info Center, the competence centre for renewable energies and energy-optimised planning, construction and management, houses more than 20 companies with over 500 employees offering products and services for the energy revolution. The Solar Info Center has been certified with the LEED Platinum sustainability label (Leadership in Energy and Environmental Design) – and is the top building in Germany in its category since its recertification in 2020 under the current LEED v4.1 criteria catalogue. The Solar Info Center thus provides its tenants and visitors with an energy-efficient building with an innovative energy concept at conventional costs. The concept is based on geothermal energy, photovoltaics, solar thermal energy and a natural cooling system, among other things – an extraordinary and, with its remarkable use concept, largely unprecedented special purpose property for renewable energy and energy efficiency.

7 MAERTIN – Technischer Fachhandel: Warehouse heat via geothermal energy/ heat pump

The company's new production hall is heated using only geothermal energy. This has reduced the energy costs for heating by more than 50 percent in comparison with the older warehouse. In addition, employees report that geothermal underfloor heating is a much more pleasant way to heat.

Stephanie Maertin, Managing Director of Maertin – Technischer Fachhandel

"As a family business, sustainability is very important to us. We have already been able to implement a great deal through the construction of new buildings and refurbishment of existing buildings. We will continue to optimise our processes in the future in order to gradually move toward becoming a climate-neutral company."

8 EICHELBUCK: Landfill gas

One of the decomposition products of all landfills where bio-waste was once deposited is methane. In order to avoid releasing this energy-rich yet environmentally harmful gas into the environment in an uncontrolled manner, it is siphoned off at the former Eichelbuck landfill via a multitude of gas wells and used for energy generation. Gas pipelines transport both the methane from the landfill and the biogas from the Reterra biogas plant to a cogeneration plant in the nearby district of Landwasser. While the heat produced here can be used directly by end users, the electricity generated is fed into the public grid.

Energy efficiency

Projects & implementation examples

9 ALEXANDER BÜRKLE: Lighting

A significant proportion of the lighting in the company has been switched to LED. This has already helped save 200,000 kWh of electricity in some parts of the warehousing. This corresponds to 80.2 tons of CO_2/ year. The aim is to gradually bring all establishments up to this technological standard.

10 ALLOS: Cooling and logistics

Allos Schwarzwald GmbH has initiated many projects in its commitment to climate protection, especially in the field of energy efficiency and process optimisation. For instance, major savings in energy, packaging and water have been made possible through changes to batch sizes, a changeover from two-shift to three-shift operation, reduction of the cooling time in the sterilisation process and the switch to LED lighting.

Gregor Reddemann, Plant Manager at Allos

"Here, through implemented projects, companies can demonstrate from experience that ecologically sensible action can also be economically viable."

5 BADENOVA: Green data center

When building the new data centre for badenIT, a subsidiary of badenova, great emphasis was placed on energy-efficient and thus ecological operation. Intelligent, state-of-the-art cooling technology in the data centre, which provides energy savings of up to 60 percent, also contributes to this. Continuous energy monitoring for ongoing optimisation of the systems confirms the sustainability of the operation. A large exterior wall on the building covered with vegetation also absorbs around 1 ton of CO_2 per year.

5 BADENOVA: Energie-Effizienz-Netzwerk LEEN* Freiburg

At the end of 2016, municipal utility companies in the city took the initiative and came together to form an energy efficiency network. The aim of the network was and is the joint and transparent reduction of CO_2 emissions. To date, the participating companies have achieved a sustainable annual saving of 1,144 tons of CO_2 through the measures implemented and have therefore exceeded the original target of an annual saving of 750 tons of CO_2.

11 COHERENT | DILAS DIODENLASER: Improved energy management as of 2021

Sigrid Walker, Sustainability Manager at Coherent | Dilas Diodenlaser

"I look forward to the next workshops, in which I know I will find inspiration for the implementation of more sustainability projects in our company. I particularly appreciate the opportunity to get to know the companies in the Industrial Area Nord better, and to make contacts or strengthen existing ones within the context of the GIP workshops."

7 MAERTIN – Technischer Fachhandel: Efficient office tower with building core activation

The 6-story office tower was planned with a focus on energy: large bay windows let in plenty of light in winter, but in summer the shade inside and outside ensures that the building does not heat up. It has an active building core which provides pleasant warmth in winter and slight cooling in summer. Thanks to intelligent ventilation with night-time cooling, the air remains in motion and uses the cooler night air for regulation, particularly in the summer.

12 FRAUNHOFER ISE: Center for Power Electronics and Sustainable Grids

The Fraunhofer Institute for Solar Energy Systems (ISE) in Freiburg opened its new Center for Power Electronics and Sustainable Grids in 2019. With its own 110 kV high-voltage connection and an output of 40 MVA, the laboratory centre has a one-of-a-kind research infrastructure. It thus meets the increased requirements for power electronics as a key technology for the energy revolution.

Gerhard Stryi-Hipp, Head of Group Smart Cities Fraunhofer ISE

"The Green Industry Park is now entering the second phase: climate neutrality must be our goal here."

12 FRAUNHOFER ISE: Center for High Efficiency Solar Cells

The Fraunhofer Institute for Solar Energy Systems (ISE) opened its new Centre for High Efficiency Solar Cells (ZhS) in early 2021. The new building with 1000 square metres of laboratory and clean room space offers the perfect conditions for the further development of silicon and III-V technology and focuses on the combination of these two materials to form highly efficient tandem cells, which are among the most promising future technologies in photovoltaics.

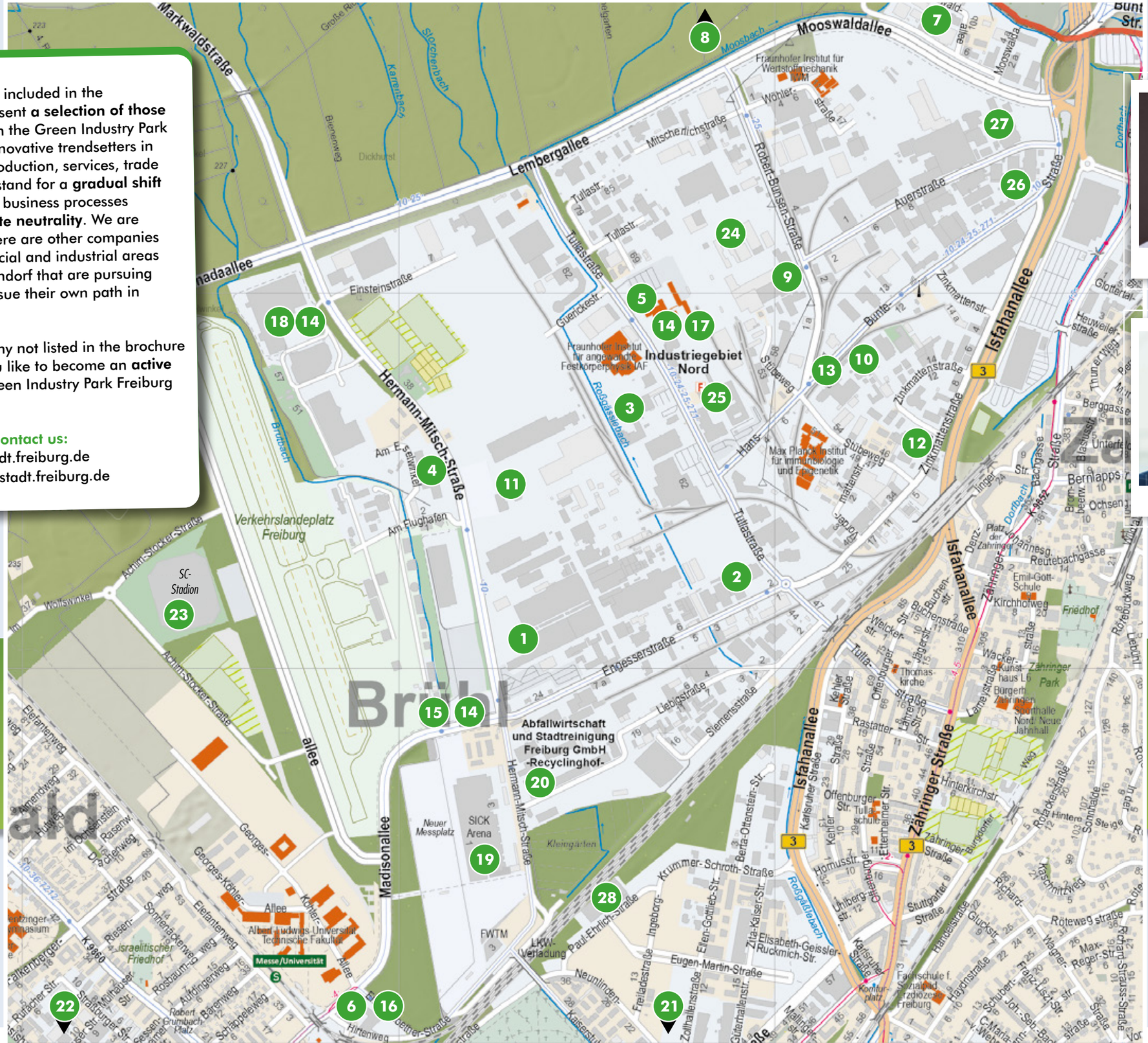
*LEEN = Learning Energy Efficiency Network

Locations of the GIP companies in the Industrial Area Nord

The companies included in the brochure represent **a selection of those participating** in the Green Industry Park initiative. As innovative trendsetters in the fields of production, services, trade or crafts, they stand for a **gradual shift in the focus** of business processes **towards climate neutrality**. We are certain that there are other companies in the commercial and industrial areas Nord and Hochdorf that are pursuing or want to pursue their own path in this direction.

Is your company not listed in the brochure and would you like to become an **active part** of the Green Industry Park Freiburg network?

Then please contact us:
dirk.kron@stadt.freiburg.de
sabine.wirtz@stadt.freiburg.de



Klaus von Zahn,
Head of the Environmental Protection Office

"The update to the 2019 Freiburg Climate Protection Concept has shown how much potential there is for climate protection in Freiburg's industrial and commercial areas."

André Olveira-Lenz,
Head of the Innovation and Environment Business Unit at IHK Südlicher Oberrhein

"The issue of climate neutrality has reached many companies. The GIP initiative is therefore more important than ever."

www.greenindustrypark-freiburg.de

Mobility

Projects & implementation examples

13 HANS-BUNTE-STRASSE: Bicycle friendly alteration

After nine months of construction, the extension of Hans-Bunte-Strasse between Tullastrasse and Zinkmattenstrasse to a length of approx. 1,200 m was completed in 2019. This extension also included the repair of the pavements and bicycle paths that run parallel to the street, after these were severely damaged by the rising roots of the plane trees there. The renovation work has improved safety and the appeal for cyclists. At the same time, eight bus stops and crossings were also redesigned to be barrier-free and accessible to persons with disabilities.

14 Freiburger Verkehrs AG (VAG): Bike sharing scheme FRELO

Cycle from work to the bus stop or simply leave your car behind – with Frelo rental bikes, you can get from A to B flexibly and even cross the last kilometre from the bus stop to your destination. There are currently three stations in the Green Industry Park Nord: at the Messe tram stop, at IKEA and at badenova (Tullastrasse).

15 VAG: Public transport expansion

After almost two years of construction, the extension of the Messe tram line could start operation on 13 December 2020. This enables the Freiburger Verkehrs AG (VAG) light rail network to offer a better connection of public transport to the exhibition centre, the new SC stadium and the Green Industry Park. In addition, line 23 was newly created and line 24 was gradually improved with financial support from the Freiburg Climate Fund, thereby optimising public transport connections to the industrial area.

16 STADTMOBIL

Car-sharing is now also possible in the industrial area. The provider Stadtmobil offers three vehicles at the Solar Info Center, including one electric vehicle.

17 INDUSTRIERADLER

The "Industrieradler" (industry cyclists) project was launched in 2017 by employees at the companies in the "Nord" industrial area. Many people in the working group, which consists mainly of works councils from the companies in the GIP Nord, have previously been involved in the "Umweltfreundlich zum Betrieb" (environmentally friendly commuting) group. The aim is to make commuter traffic in the industrial area more environmentally friendly. Incentives include, for instance, a monthly prize draw for employees who do not use a car to get to work.

Daniela Ullrich, badenova Works Council, "Industrieradler" (industry cyclist)

"We want to contribute to making commuter traffic more environmentally friendly in the industrial area with our cross-company "Industrieradler" project. We hope to do this by motivating employees to switch to bicycles or public transport or even walk to work instead of taking the car."

18 IKEA: Cooperation with LastenVelo

Freiburger Verkehrs AG and the furniture store IKEA are working with the Lasten-Velo Freiburg project for sustainable mobility through the provision of cargo bikes. IKEA customers, for instance, can borrow an electric cargo bike in order to carry their purchases home in a sustainable way, and maybe get some exercise in while they're at it.

19 MESSE FREIBURG: Charging points for visitors' e-vehicles

E-vehicles can "refuel" at the newly designed, accessible exhibition centre parking lot at five charging stations with two charging points each. Payment is taken separately from the parking fee charged for events - using a separate payment system.

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5 BADENOVA: bn mobil – corporate mobility management

badenova has installed 42 charging points for its fleet vehicles and ten 230 volt charging facilities for employees' private vehicles at the Freiburg site. For many years, achieving a sustainable mix in the composition of badenova's vehicle pool has also been the focus. The company received the "Mobil-Siegel – klimafreundlich zur Arbeit" (climate-friendly commuting seal) in 2021.

4 CAR DEALERSHIP MÄRTIN

The Märtin car dealership is increasingly shifting its focus to e-mobility and has installed nine public charging stations for e-vehicles on its premises. Further expansion of the charging infrastructure is planned. For this purpose, the photovoltaic system will be expanded for maximum possible roof coverage.

9 ALEXANDER BÜRKLE: Corporate mobility management

By 2025, Alexander Bürkle wants to cover 25 percent of its transportation range using electrically powered vehicles and, in parallel, to promote alternative mobility concepts for its employees. To this end, the vehicle fleet is being gradually converted and the expansion of the charging infrastructure adjusted.

Saskia Glink and Andreas Treffeisen, Sustainability Management at Alexander Bürkle

„The Green Industry Park is a platform that helps us to make contacts and to get new ideas"

20 ABFALLWIRTSCHAFT UND STADTREINIGUNG FREIBURG (ASF): vehicle fleet

As early as 2012, ASF began successively converting its vehicle fleet to an emission-free and climate-friendly fleet using battery and fuel cell-based drive systems. This process began with the acquisition of one of the first collection vehicles in Germany with low-emission hybrid technology. Ten years later, e-mobility has come to play an important role at ASF. Freiburg's streets are now cleaned using seven electric flatbed vehicles and sweepers, including the first electric sweeper in Germany, which has been in use since 2017. In the area of waste disposal, the switch from fossil fuels to renewable energy began in 2021 with the deployment of two hydrogen-powered collection vehicles. Twelve more collection vehicles with a fuel cell drive will give the ASF fleet a new ecological face by 2023.

20 ASF: Cargo bikes for cleaning operations

The conversion of the vehicle fleet to alternative drive systems is a crucial part of achieving the climate objectives. Six cargo bikes specifically designed for urban cleaning were purchased in 2021 as part of the "Emission-free urban district cleaning" pilot project. Thanks to the integrated electric motors, the so-called "Gässleflitzer" (alley speedsters) produce no emissions and at the same time herald a turning point in mobility. The six cargo bikes replace one flatbed vehicle, are much quieter on the road and save 2.2 tons CO_2 per year.

21 ROC-KET: Last mile and City-Hub

Roc-Ket Cargo Bikes GmbH is collaborating with several large logistics companies and, with its cargo bikes, supports them in the logistics of the first and last mile. A city hub was established to this end on Neulindenstrasse as a temporary storage facility. The bikes and trailers are designed so that consignments of up to 300 kg can be loaded on Euro pallets. The Freiburg startup also develops cargo bikes including attractive branding and adapts them to suit customer requirements. Roc-Ket Cargo Bikes GmbH thus helps to reduce heavy goods traffic in the city. The start-up was awarded the "MobilSiegel – klimafreundlich zur Arbeit" (climate-friendly commuting seal).

Renewable energy

Other projects

Green Industry Park Freiburg

Projects & implementation examples

22 SOLARKAMPAGNE of the City of Freiburg

"Dein Dach kann mehr" (Your roof can do more) is the motto of the municipal photovoltaic campaign for homeowners and businesses, which was launched in 2017. The City of Freiburg offers companies personalised on-site advice free of charge in collaboration with the Regio Freiburg Energy Agency. Independent energy consultants come into the business, answer all questions in relation to the use of solar power and offer an initial assessment of cost effectiveness and feasibility, as well as provide concrete recommendations for implementation. As a rule: generating your own solar power on the roof of your business is worth it!

23 SC-STADION: New PV-system

With a peak output of 2,300 kWp, the solar roof implemented by badenovaWÄRMEPLUS will generate approx. 2.3 million kWh of electricity per year and will thus be able to cover the current forecast for the stadium's annual electricity consumption without producing any CO_2. Thanks to a district heat supply, the appropriate lighting technology and the PV system, the stadium is planned to be as climate neutral as possible during operation.

10 ALLOS: Citizen solar plant in combination with combined heat and power unit

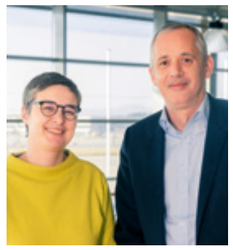
A solar system born of an employee initiative and operated by Bürger-Energie-Genossenschaft March e.G., and a cogeneration plant cover 27 percent of the internal energy consumption.

8 Solar plant on EICHELBUCK

The PV system, which was built on the south side of the former Eichelbuck landfill in 2011 and expanded in 2019, is Freiburg's largest solar plant with an installed capacity of 3 MWp. It is a joint project between badenova-WÄRMEPLUS and Abfallwirtschaft und Stadtreinigung Freiburg (ASF, Freiburg Waste Management and City Cleaning). Producing approx. 3.4 million kWh of electricity per year, it covers the electricity consumption of approx. 1,400 households. Additional PV systems at the St. Gabriel recycling centre increase the annual production of green electricity to around 3.9 million kWh and mean that ASF is producing a significant electricity surplus.

19 PV-system MESSE FREIBURG

At 650 kWp, the solar system installed on the exhibition center roof is one of the biggest solar systems in Freiburg and will be upgraded further in the coming years.



Hanna Böhme, Daniel Strowitzki, Managing Directors of FWTM

"As a cooperation partner, we want to actively contribute to the development of the Industrial Area Nord into a sustainable, energy and resource-efficient industrial area that serves as a model throughout Germany both through our own projects, such as PV roof systems or measures in the field of heat and cooling supply, and as a member of the Industrieradler project."

24 GROSSMARKT FREIBURG: PV-system

As a fresh produce centre in a region where three countries meet, Großmarkt Freiburg GmbH offers producers and retailers in the region the opportunity to sell fresh and regional fruit, vegetables and flowers. In future, the tenants' cold stores will be supplied with solar power from the market's own roof. This is made possible by the tenant power model from solargeno e.G. (Solar-Bürger-Genossenschaft Freiburg), which takes on the investment in and operation of a photovoltaic system. The model project for tenant power in business was supported by the city's Climate Protection Fund.

Sabine Fey, Managing Director of Großmarkt Freiburg

"We had wanted to implement a solar system on the roof of our market hall for many years. Thanks to the commercial tenant electricity model from solargeno, this has now been achieved."

25 FIRE STATION TULLASTRASSE: Solar plant

The solar system on the new fire station on Tullastrasse came online in 2019 with an output of 5.76 kWp.

26 INNOVATION ACADEMY

The four companies ASF, badenova, FWTM and TDK-Micronas took part in the "Blühende Industriegebiete" project (flowering industrial areas, called "BIG" for short) launched by the Innovation Academy from 2018 to 2020. The aim was to work together with trainees from the respective companies to develop projects which contribute to greening and increased biodiversity in the industrial area. The project included, for instance, the creation of an outdoor break area called "Lichtblick" (bright spot) in the new FWTM administration building, a flower meadow with a green break area with plants and bird nesting boxes on the TDK Micronas company premises and an "urban gardening area" for badenova employees. ASF is happy with its new outdoor canteen seating area with green wall and murals focusing on biodiversity. BIG was designated an official project of the UN Decade on "Biodiversity", sponsored by the German Federal Environmental Foundation, Stiftung Naturschutzfonds Baden-Württemberg (Baden-Württemberg nature conservation fund) and the badenova Climate and Water Protection Innovation Fund, as well as Sparkasse and the Environmental Protection Agency.

Peter Neske, Innovation Lead at Pfizer

"With our Freiburg site, we want to continue being a role model for the entire Pfizer Group and to further advance sustainability."

27 PFIZER

Pfizer's green strategy in Freiburg includes a comprehensive energy management system with wood pellet boilers, absorption cooling, geothermal energy and solar collector systems as well as continuous production (CMT), making the plant a pioneer in the pharmaceutical industry in terms of environmental protection and sustainability. The plant in Freiburg is among the most cutting-edge production facilities in the world in the pharmaceutical industry. It has two highly automated factories for continuous production of innovative medicinal products in tablet and capsule form. In addition, it is the largest solid pharmaceutical packaging plant in Pfizer's global production network.

28 WEtell

The young company WEtell GmbH from Freiburg makes mobile communications sustainable. Beginning its journey as a start-up in the Lokhalle creative park at the Güterbahnhof (old freight terminal area), WEtell offers one of the first climate-friendly mobile phone contracts in Germany. Consistent data and climate protection is just as important to WEtell as transparency and fairness to its customers, who currently number more than 5,000. The company has already covered 200 percent of the energy consumption for the first 10,000 customers using its own PV systems and thus meets its self-imposed goal of offering "climate-positive" mobile communications. WEtell published its first certified public interest statement in 2021.

Industrial and Commercial Area Hochdorf

The second Green Industry Park

In 2019, in accordance with Freiburg's Climate Protection Concept, the industrial and commercial area Hochdorf also took its first steps in the process of becoming a "Green Industry Park". The Industrial Area Hochdorf was selected because it differs from the Industrial Area Nord in its structure and mix of industries: around 200 companies in the fields of production, logistics, services and crafts are based there and employ about 4,000 people across the 120-hectare area. These include committed pioneering companies and companies that have themselves expressed a concrete interest in the project.

The fact that the Gewerbeverein Hochdorf (Hochdorf Trade Association) was open to close collaboration and offered its active support from the outset was also important. This also applies to the municipal administrator and the local council in Hochdorf.

First, a climate protection sub-concept was developed for Hochdorf (2020/21), which showed that there is significant potential for a noticeable reduction of the CO_2 footprint in the areas of electricity and heat supply. The potential for in-house electricity generation using PV systems is particularly high and increases in efficiency are also possible in many technical areas. The topic of (sustainable) mobility also plays an important role for many companies.

During the course of development of the climate protection sub-concept, fifteen TOP measures were identified in cooperation with local companies; these measures are planned to be implemented in a collaboration between the city and the various companies. The first implementation steps started in the spring of 2021: companies took advantage of the commercial PV consultations from the "Dein Dach kann mehr" (Your roof can do more) municipal subsidy programme as well as efficiency consulting (KEFF) offered by the Kompetenzzentrum Energieeffizienz (energy efficiency competence centre). Several companies have come together to work on the idea of a shared e-vehicle fleet or cross-company carsharing model with the support of the Regio Freiburg Energy Agency. Taifun-Tofu GmbH took the initiative and financed the first Frelo test station (bike rental) in an industrial area. Dangers for people commuting by bike are also being identified and improved. The network ethos also plays an important role in the GIP Hochdorf: In addition to exclusive workshops and events for the Green Industry Park Hochdorf, there will also be formats that should appeal to companies in both GIPs.

1 Abwasserzweckverband Breisgauer Bucht (AZV): PV-system

When it was built in 1995, the Abwasserzweckverband Breisgauer Bucht (Breisgauer Bucht wastewater association) office building was one of the first low-energy commercial buildings in Freiburg. Since then, there have been continuous investments in the expansion of renewable energies, both in Freiburg and at the Forchheim sewage treatment plant. In addition to photovoltaic systems on the office building and the sewage treatment plant, the wastewater association also operates three cogeneration plants. The sewage gas produced in the process is used to generate environmentally friendly electricity and heat for internal consumption. Wherever possible, the vehicle fleet is being switched to electric vehicles. The idea of installing another photovoltaic system on the vehicle hall at the office was born as part of the GIP Hochdorf process.

2 BECHTLE IT-SYSTEM HOUSE

Bechtle operates a fleet of around 50 vehicles at its Freiburg site, including a rapidly growing number of hybrid and electric vehicles. Intelligent charging infrastructure with a total of 20 charging points was put into operation in 2020. This ensures that electric mobility constitutes a major part of the total mileage and that sufficient free charging points are always available for employees and visitors. After completion of the current expansion stage in 2021, the Bechtle Group now has 300 centrally managed charging points in the DACH region. Software-based charging and energy management ensures that the usage always fits into the existing energy landscape efficiently and cost-effectively.

3 SIRIUS: LED and e-vehicle fleet

Following an energy efficiency consulting service provided by KEFF*, more than 100 old neon tubes were replaced with state-of-the-art LED lighting in 800 square metres of the office and production rooms, as well as in warehouses and workshops. In addition, processes were simplified using motion sensors and the lighting of all workplaces was redesigned to be more ergonomic. The company vehicle fleet is gradually being converted to e-mobility. Sirius GmbH is also pressing ahead with a carpooling project for companies at the GIP Hochdorf.

4 STRECK Transport

Back during the construction of their administrative building in 2009, Streck focused on energy conservation, implemented concrete activation in the customer centre and used surface geothermal energy (groundwater) for heating and cooling. LED lighting was also installed both indoors and outdoors. The waste heat from the data centre is used to heat the building. A hybrid lorry was added to the vehicle fleet. A 200 kWp photovoltaic system is planned for 2021/22. In addition, preparations are underway for the construction of charging infrastructure for electric and hybrid vehicles.

5 TAIFUN-TOFU

At Taifun-Tofu GmbH, strategy planning, management and monitoring of sustainability activities are done directly by the management with the help of an integrated management system. For many years, Taifun-Tofu has been using 100 percent green electricity in its core operations, resource-efficient food production and modern environmental technologies (photovoltaics, heat recovery). The company saves 32,600 kWh a year as a result of the switch to LED technology. 100 percent of the organic soya comes from contract growers in Germany, Austria and France. The company's products deliberately have a long shelf life.

Alfons Graf, Managing Director of Taifun-Tofu GmbH

"The consistent focus on sustainability in all processes and our commitment to combating food waste played a key role in our recognition as "Germany's most sustainable SME". The 2020 German Sustainability Award is a great source of pride for us, and at the same time it spurs us on to do even more: we are therefore delighted to contribute wholeheartedly to the Green Industry Park Hochdorf project."

*KEFF = Regionale Kompetenzstellen der Netzwerke Energieeffizienz

Expert interview

With Prof. Claudia Kemfert
Deutsches Institut für Wirtschaftsforschung e.V. (DIW Berlin, German Institute for Economic Research) Energy, Transportation and Environment

[6 questions on the economy and on climate neutrality]

1 **The Green Industry Park Freiburg is home to numerous medium sized as well as large companies. Many are asking themselves: how do I tackle the operational challenge of climate neutrality? Imagine that you are a Freiburg-based business owner: what would you do first?**

I would invest in renewable energy for self-sufficiency, energy efficiency measures and electric mobility. There is huge potential for energy savings and for using renewable energies. That would be the first step in the right direction.

2 **What do you think the energy supply will be like in the future? And what are the three key levers for energy market design that would result in the greatest benefit for climate protection?**

The energy supply of the future is renewable. Energy market design must focus on renewable energies. Calls for tenders should include not only cost efficiency but also systemic relevance and security of supply. A market value model that takes all aspects into account could facilitate the urgently needed expansion of renewable energies, especially in the south. Renewable energies are team players that work together. Virtual power plants are the future: all renewable energies are interlinked through digitisation and flexibilization such that their security of supply is comparable with a conventional power plant. In addition, CO_2 prices together with contracts for difference are important. And PPAs should increase marketing opportunities.*

3 **In 2021, the German government introduced CO_2 pricing for the transportation and heating sectors. In your opinion, how high would the CO_2 price have to be in order to meet the German government's climate neutrality target (2045)?**

A CO_2 price can only be an accompanying measure, because climate neutrality needs a wide range of measures. We believe that a CO_2 price of 80 euros per ton is a sensible start, which will increase to 180 euros per ton by 2030. The money should be refunded, an annual per capita climate premium should provide social balance.

4 **Electricity consumption is expected to rise in the future, and this must be produced in a climate-neutral manner. What would you say to business owners who are concerned that electricity prices, which are already high by European standards, will continue to rise?**

Prices are rising mainly because we still have a very high proportion of conventional energy in the system. In addition, there are too many charges and levies on the price of electricity in Germany, so it makes sense to reduce the electricity tax. The fact is: the EEG (Renewable Energy Act) levy decreases as the CO_2 price rises. Renewable energies are getting cheaper and are already much cheaper than nuclear and coal energy. Expanding the generation of renewable energies can help lower the price of electricity. And, see question 1: the best thing is to be self-sufficient and produce your own electricity, the price is unbeatable.

5 **Short amortisation targets in the industry often impede climate-friendly investments which only "pay off" ecologically and economically after a longer period of time. What could be done to change that?**

Two things: direct economic assistance to get the climate-friendly technologies onto the market and to help the economy with the transition. So-called contracts of difference could also help to cushion the additional costs.

6 **One final question: How hopeful are you that the full transition to a decarbonised economy and society will succeed in the next 25 years, as the EU Commission resolved to do in Europe?**

I'm optimistic. People have become aware of climate change as a result of terrible events. Governments are finally reacting. The economic opportunities are vast.

ABOUT CLAUDIA KEMFERT

Claudia Kemfert has been head of the Energy, Transportation, Environment Department at the German Institute for Economic Research since 2004 and has been a professor of energy economics and sustainability since 2009.

*PPA = Power Purchase Agreement / Stromkaufvereinbarung

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Green Industry Park Freiburg

"Together for more energy and resource efficiency in industry and commerce"

An initiative by:

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