

*In dialogue for
sustainability*

EEW Sustainability Magazine 2023/2024

YESTERDAY. TODAY. TOMORROW.

On a sustainable path

Issue 02

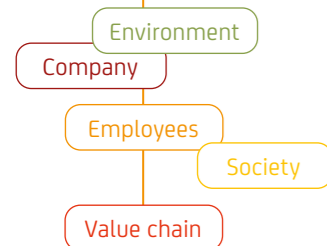
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eew
Energy from Waste

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EEW Art
Photographer Sjoerd Knibbeler

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Economic viability is the crux of the matter

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Research and development
EEW on the path to a
sustainable future




New paths, new technologies, sustainable solutions



Dr Joachim Manns, Timo Poppe, Stefan Schmidt (from left to right)

 **Watch the statement**
by Timo Poppe



 **Read our**
Sustainability Report 2023



Yesterday, today, tomorrow. These three words not only cover a range of time, they also symbolise the development and ambitions of EEW. We always look at development from several perspectives – and for good reason. Over our history stretching back more than 150 years, EEW has been constantly evolving and finding and taking new paths.

As the Board of Management, it is our great pleasure to present to you the newest issue of our sustainability magazine. Two of us, Timo Poppe and Stefan Schmidt, have recently been appointed to the Board of Management. Together with Dr Joachim Manns, we form a very dedicated, modern management team who is firmly committed to continuing EEW's successful development.

As a management team, we are bringing new impetus and taking our EEW into the future with fresh ideas. We are convinced that this will release new energy in the company to pursue innovative and solution-oriented paths.

In today's world, we are facing numerous challenges, whether it be climate change, scarce resources or the need for sustainable energy supplies. As a company committed to the principle of the circular economy and climate-friendly energy production, we are aware of our responsibility. And every day we do our part to develop and implement sustainable solutions. EEW is well prepared for the challenges of the future. With a sound strategy and very specific goals, we have aligned our activities with sustainability.

In everything we do, we never forget that our employees are the reason why EEW can look towards the future with great confidence. With their knowledge, experience and motivation, the employees provide both the foundation and the energy for the EEW of tomorrow.

In our view, interactions with customers, suppliers, policymakers, scientists, our employees and the public – to discuss the past, the present and the projects of tomorrow – are essential for finding solutions and synergies that will positively influence our company. With this in mind, we invite you on a journey with us – to yesterday, today and tomorrow. Dive into the world of EEW and together let's explore the diverse projects and plans for a sustainable future.

Please join us in dialogue for sustainability.

Timo Poppe

Chairman of the Board of Management

Dr Joachim Manns

Member of the Board of Management

Stefan Schmidt

Member of the Board of Management

Safe waste utilisation and climate-friendly energy



EEW in the year 2023

around **1,450**

employees work at EEW Energy from Waste

17

thermal waste utilisation plants operating
in Germany and neighbouring countries

5

plants for thermal sewage sludge treat-
ment in operation, under construction or
in planning

around **4,900,000**

tonnes of thermally treated residual
waste and sewage sludge

around **1,035,000**

MWh of district heating generated

around **75,000¹**

households could be supplied with
the district heating generated

around **2,435,000**

MWh of electricity produced in a climate-friendly manner

around **720.000²**

households could be supplied with electricity
produced in a climate-friendly manner

around **3,050,000**

MWh/a of process steam produced

By thermally treating non-recyclable residual waste and sewage sludge, we reduce the volume of waste, safely and harmlessly eliminate the hazards associated with the waste and recycle scrap metals and compound materials. In addition, we efficiently utilise the energy contained in waste to generate process steam for industrial plants, district heating for residential areas and environmentally sustainable electricity. Our aim is to increase the share of materials that get recycled and to further reduce the share of CO₂ that is released into the atmosphere. Ever-increasing efficiency and new technologies are the decisive levers here. EEW sees itself as a driving force – also because of its size – in this area.



Let's learn **from**:yesterday

Sharing knowledge, fostering communication

We make every effort to ensure our employees work safely at EEW. We comply with all laws and regulations and learn something new every day. To do this, we need the right attitude, the right knowledge and the ability to persuade others and get them on board. A “safety culture in our hearts and minds” is therefore the motto for everyone working on safety at EEW. This is also true for Stefan Bakker, Shift Manager and Safety Officer at EEW's Knapsack site. He knows how to prevent accidents and identify hazards at an early stage. To support him in his work, we have formed a new, central Occupational Safety department to further enhance the prominence and effectiveness of this topic.



Find out more online:
www.lets-talk-about-tomorrow.com



Stefan Bakker
Shift Manager and Safety Officer at
EEW's Knapsack site

2023

Highlights of the year

January



From coal to the circular economy:
EEW celebrates its 150th anniversary

EEW's Board of Management adopts revised **sustainability strategy** – including the roadmap

March

EEW subsidiary **NEEW Ventures** launches first spin-off: **WASTEER** enables digital analysis of delivered waste, helping to unlock further efficiency potential

EEW and LyondellBasell sign a **letter of intent for a strategic partnership** to extract and recycle plastics from residual waste that is currently impossible to recycle.

EEW introduces the **MasterPass**, a further training programme specifically for colleagues working in our plants.

February



Energy utility Energieversorgung Filstal (EVF), the district of Göppingen and EEW Göppingen **sign a memorandum of understanding** to investigate if and under which conditions more heat can be extracted from the Göppingen plant

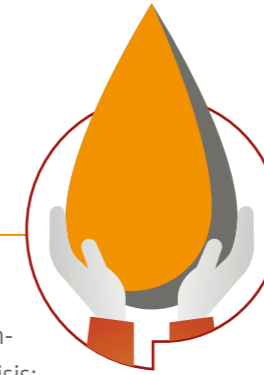
EEW hosts the **1st South Baden Sustainability Day**

April

Pilot project for **holistic health management** begins at Stavenhagen site



June



EEW's project "Resource conservation in the chemical crisis: wastewater substitutes ammonia in flue gas purification" **wins CEWEP Award 2023** in the "technological innovation" category

July

Festive **inauguration of Lower Saxony's first sewage sludge mono-incineration plant** in Helmstedt

November

Trial operations commence with the **first fire at the sewage sludge mono-incineration plant** at the Stavenhagen site



Successful pressure test for 120 Megawatt boiler at **Stapelfeld plant**

December

June



Start of the test phase for **CapsolGo CO₂ capture plant** at Hannover site

Successful **boiler pressure test** for new block 3 at **Rothensee plant**

October

Occupational safety: *Safety culture in our hearts and minds*

In 2023, the topic of safety in the work environment was strengthened even further at EEW with the creation of a dedicated central Occupational Safety department. The overarching goals have been clearly defined: avoid all accidents, identify hazards early on and mitigate risks. These priorities will be pursued even more systematically with the new central department, which will provide expert support to the sites.



Complying with laws and rules and acting with common sense are one side of occupational safety. The other side is encouraging a high level of attentiveness and carefulness. An important tool for this is recognition, which at EEW takes the form of the Safety Award. It was presented for the eleventh time in 2023. This year's winner was EEW's Göppingen site near Stuttgart, which claimed the honour for the third time.

The evaluation criteria for the Safety Award include several categories: Among other things, the number of accidents plays a major role, while the documented safety inspections, the implementation of occupational health measures as well as the updating of risk assessments all contribute to the total points count. The Göppingen site won points for accomplishments such as zero accidents and the implementation of 21 activities to enhance occupational safety. In addition, the employees completed the necessary training in the stipulated timeframe and achieved a training rate of 99 per cent.

The year before, the EEW plant in Knapsack won the Safety Award 2022 with similarly good results and numerous days without accidents. Bernd Schütz, Plant Manager at the Knapsack site – and recently appointed Acting Head of the central Occupational Safety department – was thrilled with the honour but also slightly surprised at that time: “I knew we would be able to win, but not this early. I assumed it would take three years.” Occupational safety has long been a top priority at the Knapsack site, as demonstrated by the record of around 1,800 accident-free days.

Unfortunately, as Schütz reports, two accidents occurred in 2023 at the site: “Two employees cut their hands and injured their fingernails.” As is standard practice and mandatory at EEW, a report about the accident circumstances was prepared, which was also made available to all other sites. In a follow-up step, ideas were solicited for how to prevent such accidents in the future. One solution was new protective gloves that are used in the chemical industry, which are now being tested. And it is especially important, says Bernd Schütz, that occupational safety is always observed in our “hearts and minds.” He adds: “This safety culture must be understood, felt and lived by everyone.”



The Safety Award has been presented since 2013

“

Safety is just as important a factor in the company's success as the performance of our plants.

Bernd Schütz

Head of the Occupational Safety department and Plant Manager at the EEW Knapsack site



EEW Safety Award 2023

1st place with 999 points: MHKW Göppingen

2nd place with 978 points: TREA Breisgau (Eschbach)

3rd place with 977 points: Leudelage (Luxembourg)

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Roadshow

Sustainability strategy on tour

When the EEW sustainability roadmap was adopted in early 2023, it was clear that the targets and measures would need to be presented within the company so they could be put into practice. To do this, we quickly found the right tool: the existing roadshow, which had been touring the sites and central departments, rotating annually between presenting EEW's corporate strategy and the measures derived from it.



around **250**

employees in total took part



Presentation of the sustainability strategy and roadmap at the EEW sites Neunkirchen, Göppingen and Stapelfeld (top, middle, bottom)



25

stops on the roadshow's tour

“

Of the 12 topic areas in the sustainability strategy presented, in my view, the particularly relevant targets for plant operations relate to health and safety of employees, energy and climate-relevant emissions. The definition of centrally defined targets under the umbrella of the sustainability strategy results in a concentrated and consistent picture.



Thomas Walle
Technical Administrator,
Pirmasens plant

Because the sustainability strategy is an integral component of the corporate strategy, this approach was especially appropriate. The roadshow launched in the first quarter of the year with a clear concept, as Birgit Fröhlig, Head of Corporate Sustainability, explains: “We wanted to focus not only on measures and timelines but to present the strategy as part of a bigger picture: Why are we doing this? What interconnections are there? That is why we want to engage in discussions with as many colleagues as possible, so we can also raise awareness about how each individual can potentially make a contribution to more sustainability in their workplace.” The roadshow visited plant sites as well as various corporate departments and internal company events such as the EEW Controller Day and the EEW Environment Day. In total, the sustainability strategy and roadmap were presented at around 25 individual events – with very positive feedback. “The fact that we are not only talking about sustainability but are also already working on various projects and initiatives was confirmed at all stops on our roadshow.

And again and again, we were excited by the incredible dedication and numerous ideas of our colleagues,” says Birgit Fröhlig.

“

Particularly for our plant supervisors, the in-person presentation of the sustainability strategy was an important step.

Ralf Meyer
Technical Managing Director
Helmstedt plant



EEW PARTNER DIALOGUES

Good customer relations through information sharing

DISCUSSIONS ABOUT GERMANY'S FUEL EMISSIONS TRADING ACT

There are a lot of new developments in the waste management and energy sectors. To keep its customers up to date, EEW launched the EEW partner dialogues. In 2023, the content focused on Germany's Fuel Emissions Trading Act (Brennstoffemissionshandelsgesetz, BEHG). Under this law, companies that bring fossil fuels on the market or that use them to produce heat must acquire certificates for the volume of CO₂ emissions released by the combustion of these fuels. With the amendment of the law, the scope was broadened to include non-recyclable waste mixtures that are safely treated in thermal utilisation plants with energy recovery. As a result, companies, local authorities and households will face rising costs for waste management as of 2024.

“
The EEW partner dialogues are a valuable platform for our company to get timely information about important legislative changes, such as the BEHG, and then work together to develop solutions.

Ulf Bellersheim

Owner and Managing Director, Recybell-Umweltschutzanlagen GmbH & Co. KG



top: Many participants accepted the invitation to the EEW partner dialogue in Berlin

left: Andreas Dous, Sales Director at EEW, in conversation with attendees at the EEW partner dialogue in Hannover

In dialogue for sustainability

Let's learn from: **yesterday**

TIMELY INFORMATION IN A PROVEN FORMAT

As part of our EEW partner dialogue series, we hosted three larger events and a total of 18 events at all sites. With up to 60 participants from waste management firms and local authorities, the average attendance was very high. “The feedback was very positive,” says Andreas Dous, Sales Director at EEW. He adds: “As the market leader, we value good customer relationships and we very early on felt a responsibility to inform our customers and partners about the consequences of the amendment of the BEHG. To do this, we promptly formed a team to work exclusively on this topic.” Since the format of the EEW partner dialogues once again proved popular, we plan to continue it in the future.

“
As the market leader, we value good customer relationships and we very early on felt a responsibility to inform our customers and partners about the consequences of the amendment of the BEHG.

Andreas Dous

Sales Director at EEW

18

EEW partner dialogues and customer events were held in 2023.



TRANSPARENCY AND DIALOGUE

Sustainably in contact with the community

EEW engages in dialogue with all stakeholders, including – but not only – policymakers, as the year 2023 once again showed. Here are a few examples:



1ST SOUTH BADEN SUSTAINABILITY DAY: ENERGY TRANSITION IN AN ERA OF TRANSITION

Germany's energy transition is more in focus than ever, and energy from waste is playing an increasingly important role in energy security. These topics were discussed by EEW and TREA Breisgau with guests at the first South Baden Sustainability Day.

There was a lot to discuss at the 1st South Baden Sustainability Day hosted by TREA Breisgau

GERMAN PARLIAMENTARIAN JOHANNES ARLT BJERREHØJ VISITS EEW'S STAVENHAGEN PLANT

Johannes Arlt Bjerrehøj, a member of the German Bundestag for the SPD party, visited EEW's Stavenhagen site in Mecklenburg-Western Pomerania to discuss forward-looking projects. One of the topics discussed was the commissioning and first fire at the new sewage sludge mono-incineration plant.



Heike Becker, State Parliamentary President of Saarland, visits EEW Neunkirchen site

PRESIDENT OF SAARLAND PARLIAMENT VISITS EEW'S NEUNKIRCHEN SITE

Heike Becker (SPD), President of the State Parliament in Saarland, visited the Neunkirchen plant in 2023. Axel Köhler and Gerhard Hans from EEW Energy from Waste Saarbrücken explained to her that waste currently represents the second-most important fuel for district heating production.

36TH DISCOVERY DAY IN THE HANNOVER REGION

In 2023, EEW Hannover was the fifth stop on a tour conducted by the special purpose waste management association in the region of Hannover. With the theme "from tradition to modernity," this tour provided fascinating insights into the circular economy. In addition to many others, there was one very special highlight at EEW: Participants could marvel at a demonstration plant for CO₂ capture (www.capsoltechnologies.com).



Göppingen region's summer tours were popular, as seen here at EEW's Göppingen plant

EEW GÖPPINGEN TOOK PART IN LOCAL SUMMER EVENT SERIES

For 20 years, a special programme of local events and excursions has been a feature of the summer holidays in the district of Göppingen. At EEW's Göppingen site, guests were taken on a tour to discover what happens with their waste after it disappears into the bin and how it is ultimately used to produce electricity and district heating for the region.

OPEN HOUSE DAY AT BREISGAU SITE

In summer, the EEW site TREA Breisgau hosted an open house day. The programme included numerous attractions and information about the topics of waste and energy. There was also a tour of the TREA plant, a virtual reality plant visit with VR headsets, and much more.

Besides the examples cited here, EEW hosted numerous other events with various stakeholders at our sites. These included discussions with politicians from various parties, with industry associations and non-profit organisations, with business partners, media representatives and interested citizens. A total of around 200 events were held in 2023.

Association work

Unrivalled collaboration for sustainable business



The sustainability working group at its founding meeting in 2023.



“

We are looking forward to working together and we are convinced that with our member companies, we can make an important contribution to sustainability.

Dr Bastian Wens
Managing Director, ITAD

EEW is actively engaged in socio-political discourse and takes on responsibility outside of its own company. Accordingly, the company is actively involved in various industry associations, such as ITAD, a group representing the interests of thermal waste treatment plant owners and operators.

Within ITAD, a new sustainability working group was formed in 2023. Nearly 20 participants took part in the constituent meeting and other member companies have also expressed interest. This demonstrates that the industry has a strong interest in exchanging ideas and a desire to work together on particular topics. EEW was actively involved in the founding of the working group and is a keen supporter of the joint efforts. One of the aims of the working group is to explore the upcoming regulatory requirements the industry will soon be facing – at national and European levels. The working group's to-do list also includes actively sharing knowledge and experience of the circular economy, the energy transition and decarbonisation as well as identifying further opportunities to make business activities more sustainable.

Other industry associations in which EEW is active:

- Federation of the German Waste, Water and Raw Materials Management Industry (BDE)
- German Association of Energy and Water Industries (BDEW)
- German Waste Management Association (DGAW)
- German Association for Water, Wastewater and other elements (DWA)
- German Association of Local Public Utilities (VKU)



Overview of all memberships

EEW and 1. FC Magdeburg encourage children to think sustainably

ART, FOOTBALL AND SUSTAINABILITY

Do sustainability and football go together? “Yes!” say EEW's sponsoring partner, the football club 1. FC Magdeburg (FCM), as well as the Magdeburg organisation Villa Wertvoll, the Rothensee plant and EEW. In 2023, this resulted in a project week on the topic of sustainability and resource conservation for the FCM Kids Club members. As part of the project, the children enjoyed a week of learning and creativity at Villa Wertvoll, a facility that offers young people the opportunity to discover and explore their artistic abilities. The topic in focus was waste and the aim was to raise awareness of the careful use of resources. The programme included excursions, for

”

Football and sustainability go hand-in-hand and we are thrilled that we can join forces with EEW to take on sustainability-related projects.

Tom Lehmann
Sustainability Project Lead, 1. FC Magdeburg

”

Through this collaboration with EEW, the Rothensee plant and 1. FCM, we could inspire the children to artistically explore the topic of resource conservation in a comprehensive and hands-on way.

Simon Becker
Managing Director at Villa Wertvoll and organiser of the project week

example, to the Rothensee plant and various football pitches in Magdeburg, where waste and sounds were collected to produce artworks. And of course, there was a “field” trip to the MDCC Arena, the home stadium of FCM, which plays in the 2. Bundesliga.

Following the project week, the resulting artworks were exhibited on a game day and a documentary film created by the children was released.



View the documentary film (in German only)



Let's **act**:today

Prevention today safeguards success tomorrow

Human health is our most valuable resource at EEW. Good health is vital to our advancement and our successful journey together into the future. Health management plays an important role here. As Health Coordinator, Sonja Lentz relies on modern and effective concepts. Although the sites all have different needs, a tailored and effective occupational health management approach is always required to promote and maintain health – and it must fit in day-to-day life. Site-specific health offerings include the bike leasing scheme JobRad, preventive medical check-ups or programmes such as “fitness in the (home) office,” to name just a few. In this way, we are building the foundation now for a sustainable future.



Find out more online:
www.lets-talk-about-tomorrow.com



Sonja Lentz
Health Coordinator at EEW



In dialogue for sustainability

Economic viability is the crux of the matter



Timo Poppe (CEO) in conversation with **Birgit Fröhlig** (Head of Corporate Sustainability) and **René Münch** (Head of Business Development), discussing the future challenges and opportunities associated with EEW's sustainability strategy.

In dialogue for sustainability

Doing business in a more sustainable way requires analysis, planning, implementation and evaluation. But sometimes it is also important to casually discuss the topic of sustainability, looking both into the past and into the future. And that is exactly happened during this conversation between Timo Poppe, CEO of EEW, René Münch, Head of Business Development, and Birgit Fröhlig, Head of Corporate Sustainability.

The occasion for our talk was the completion of EEW's current sustainability report, which also means that another year has gone by. A lot happened in this year – also from a sustainability perspective.

TIMO POPPE: That is absolutely true. As a company, EEW is in the midst of a transformation that started a few years ago and is gaining momentum from year to year. We are moving away from pure-play thermal waste utilisation and looking to both the upstream and downstream value chains. In fact, we are in the process of establishing another new business area based on the recovery of residual waste. With our goal of climate neutrality in mind, we want to develop technical solutions for industrial-scale CO₂ capture. After all, reaching our goal of “net zero CO₂” will only be possible if we consider indirectly avoided fossil CO₂ emissions through the use of captured CO₂ as a raw material, for example, in the production of renewable fuels or chemicals.

There is still much to do before then. That is why EEW is investing significantly in research and development, innovative technologies and the implementation of new climate-neutral business models.

To do this, we are also working with partners from entirely different industries – in a way we have never done before. At the same time, I must say that the path we are following is not an end in itself. We take our responsibility towards people and the environment seriously and we want to make our contribution to reaching the global climate targets.

RENÉ MÜNCH: There is a lot of pressure at the moment – both from policymakers and the progress of climate change itself. The ambitions of climate policy are justifiably high, as they need to be, in light of the situation. To reach our targets, CO₂ capture solutions will be necessary, as will effective sorting of waste, particularly upstream sorting of plastics. This means we need to introduce technologies that do not exist yet. These will need to work from the get-go and this also entails a major economic risk.

BIRGIT FRÖHLIG: Here we also need to point out that this economic responsibility is borne by companies and their management – not by policymakers. The impact that political decisions can have on our work was evident in 2023 with the topic of Germany's Fuel Emissions Trading Act. If we cannot pass along these costs, they will adversely impact our earnings and reduce our opportunities to invest in more sustainable technologies. The law lacks a clear and functioning steering effect.

”

At EEW, we believe taking a responsible – meaning sustainable – approach to prepare for the future is a great opportunity to drive forward our transformation.

Timo Poppe
EEW CEO

TIMO POPPE: I definitely agree with you. It would make sense to put the onus on those who bring plastics onto the market and not on those who ultimately accept plastics to recover them in a safe and useful manner. This would have required embedding the legislation at a European level. Without that, we will be at a competitive disadvantage and it should come as no surprise when waste gets shipped abroad in future because it can sometimes still be landfilled in other countries. And this landfilling results in methane and carbon dioxide, which additionally harm the climate.

What does it mean in practical terms for EEW to follow new and sustainable paths? Where is the company now?

RENÉ MÜNCH: It will be essential, as we have said, to put the captured CO₂ to good use. We are in discussions about this, for example, with major companies in the chemical industry. Nitrogen fertiliser, carbonic acid, eFuels, methane, polymers and basic chemicals are examples of potential products. Whether these can be economically viable business models is always the key question we have to answer. Our Delfzijl site is an excellent real-world example: Here, we have the technological capability to capture CO₂ and we have already found a potential anchor client who wants to utilise this captured CO₂. At this site, we are also taking a major step towards recycling with a new plant to pre-sort the deliveries of waste. We are currently in talks with a US firm that can purchase the separated plastic fractions from us. This is looking quite good, but the economic outlook is not entirely positive yet. However, this is true not only for us but for the entire market.

TIMO POPPE: Economic viability is the crux of the matter. This is also apparent when we look beyond our own industry: The heat transition, for example, looks good at first glance. But at second glance, there are challenges with financing and economic implementation is not guaranteed. In my opinion, we still need to make the leap here from a subsidy-based to a market-based approach.

CO₂ is the big lever when it comes to climate protection. Does recycling of residual waste sometimes get lost in the shuffle?

RENÉ MÜNCH: Not at EEW. Reclaiming plastics and phosphorus are key topics for us. We invest significantly in R&D and we want to develop new business models in this way. Here, too, Delfzijl is a prime example. Because we cannot cover the entire chain from plastics production to finished recycled granulate, we cooperate with other firms. We are not alone in doing this – the entire industry is taking this approach and this will create completely new markets. However, those who speculate that there will no longer be thermal treatment of residual waste are not thinking broadly enough, in my opinion. For one thing, these plants make a considerable contribution to a secure energy supply. Not to mention there will be a need for safe waste management pathways as long as products and consumer goods which cannot be recycled are being designed, produced and brought on the market.

CO₂ and recycling are the headliners when it comes to sustainability. But this term – especially at EEW – has a much wider meaning.

BIRGIT FRÖHLIG: Yes, I would almost say this narrow focus is „unfortunate,“ even though it is clear that climate change caused by carbon dioxide must be at the centre of our efforts. In fact, though, we take a holistic approach to sustainability – meaning covering all three dimensions of sustainability. For us, environmentally responsible business is on a par with socially and ethically responsible conduct. Accordingly, we took a broad approach with our ambitious goal setting in our sustainability roadmap in 2022. In many of these areas, we are making very good progress. But there are definitely measures where we still have room for improvement, and we need to become better in order to meet the challenges of the future.

Speaking of challenges and sustainability: Does it seem the challenges are constantly growing?

BIRGIT FRÖHLIG: That impression is certainly not wrong. One reason for this is that we have reached the stage of active sustainability management: It is no longer just about reporting or individual projects, it encompasses all business processes and activities at EEW. In addition, there is the upcoming reporting obligation under the Corporate Sustainability Reporting Directive, the EU Taxonomy and the legislation on corporate due diligence in the supply chain. All three of these will require massive administrative efforts on our part but are nonetheless primarily a major opportunity to spur on the necessary transformation.

TIMO POPPE: I would agree with this. And I would also broaden the perspective to include our innovative technologies and new business models: At EEW, we believe taking a responsible – meaning sustainable – path into the future is a great opportunity to drive forward our transformation. The foundation for this is our team of more than 1,450 employees. We know we can completely rely on their knowledge, skills and motivation.

”

We invest significantly in R&D and we want to develop new business models in this way.

René Münch

Head of Business Development at EEW



René Münch and
Birgit Fröhlig discussing
sustainable business models
and innovations at EEW

Sustainability roadmap 2030

Our path to reaching our sustainability goals

Company

PROGRESS

ETHICS AND INTEGRITY

Our goal is to prevent infringements of laws, guidelines and our code of conduct.



DIGITALISATION

Our goal is that at least 70% of employees take part in at least one measure or training per year to strengthen their digital skills.



INNOVATION

Innovation-driven growth projects contribute at least 20% to total revenues.



Value chain

PROGRESS

CUSTOMER RELATIONSHIPS

Customer satisfaction is the foundation for our success. That is why we want evaluations of our performance to reach at least "good" on average.

not yet recorded

Society

PROGRESS

INVOLVEMENT IN POLITICAL AND SOCIETAL PROCESSES

We want to host at least five dialogue events per site each year.



Employees

PROGRESS

EMPLOYEE DEVELOPMENT

We are increasing the number of further training hours per employee to at least 40 hours per year.



EMPLOYEE DEVELOPMENT

We will double the share of women in managerial positions.



EMPLOYEE HEALTH AND SAFETY

We aim for a health rate of at least 95%.



EMPLOYEE HEALTH AND SAFETY

Our goal is to prevent reportable injuries.



WORKING CONDITIONS AND CORPORATE CULTURE

Committed employees guarantee the future of EEW. We aspire to achieve an employee satisfaction level of "good" or higher.

not yet recorded

Environment

PROGRESS

WASTE (INPUT)

We strive to offer reliable waste treatment capacity by achieving at least 92% time availability for all thermal treatment plants.



ENERGY (OUTPUT)

We are increasing the energy efficiency of our thermal waste treatment plants by 15% on average.



CLIMATE-RELEVANT EMISSIONS (OUTPUT)

We are reducing our greenhouse gas emissions in accordance with the GHG Protocol by at least 20%.



(ADDITIONAL) OUTPUT MATERIALS/ RESOURCES

We want to achieve a recycling rate of at least 70% for our residues.



Find out more about our sustainability goals in the EEW Sustainability Report at www.lets-talk-about-tomorrow.com:



District heating

Expansion proceeding by leaps and bounds

District heating is a pillar of EEW's day-to-day business. Investments in district heating and greater efficiency in heat production are always a priority for us. To this end, EEW signed new contracts for the supply of climate-friendly district heating and entered into cooperative agreements.



≈ 1,035,000

MWh of district heating produced by EEW in 2023. This equates to the annual demand of nearly 75,000 households.¹



ALTERNATIVE TO NATURAL GAS AND OIL IN STAVENHAGEN

The waste sent to a thermal utilisation plant is usually a mixture of organic combustible components and plastics. If this mixture were sent to landfill, as it typically was for a long time, it would result in the release of methane, a gas far more harmful to the climate than CO₂. Simultaneously, many local authorities want to transition away from using the fossil fuels natural gas and oil, particularly in the wake of the Russian attack on Ukraine. The City of Stavenhagen, for example, located in the Mecklenburgische Seenplatte district in the state of Mecklenburg-Western Pomerania, decided in 2023 to switch over its district heating network with EEW's help from 2025: from fossil fuels to energy produced by the thermal utilisation of sewage sludge and waste.

SUCCESSFUL TEST OPERATIONS IN BRANDENBURG AN DER HAVEL

In the state of Brandenburg, things are one step further along: Trial operations of the new district heating line that runs between the EEW site in Premnitz and the city of Brandenburg an der Havel began in 2023 – and were successful! This district heating pipeline has an impressive length of 20 km and yet barely loses any heat along the route. After the start-up of the district heating substation in mid-2024, from winter 2024/2025 EEW will supply the base load of 35 Megawatts to provide heat for the city of Brandenburg an der Havel.

¹ Average annual consumption per household according to "Heizspiegel" heating survey: 13,860 kWh

COLLABORATION IN HANNOVER BEING EXPANDED

In Hannover, Enercity – one of the largest district heating suppliers in Germany – already supplies the state capital with up to 300,000 MWh of district heating from the EEW plant. This means that around one-quarter of the local demand is being met by green energy. The supply could be expanded from 2025 onwards.

INVESTMENTS TO INCREASE OUTPUT IN STAPELFELD

Further north, specifically in Stapelfeld, a city on the eastern edge of Hamburg, EEW started construction in 2022 on a new facility to replace an older thermal waste utilisation plant. In addition, it is planning a new sewage sludge mono-incineration facility. Today, EEW's Stapelfeld site supplies around 260,000 MWh of district heating, and this is expected to rise by 100,000 MWh as of 2024.

SENFTENBERG SOURCES HEAT FROM EEW'S GROßRÄSCHEN PLANT

Local utility Stadtwerke Senftenberg GmbH signed a district heating contract with EEW in May 2023 to decarbonise its heat supply. From 2026, up to 80,000 MWh of industrial waste heat from EEW's Großräschen plant will be delivered via a 10-km-long district heating pipe to Stadtwerke Senftenberg. With this project, the city wants to take a significant step towards decarbonising its heat supply.



”

The memorandum of understanding is an important step towards the heat transition urgently needed in the face of climate change.

Edgar Wolff

District Chief Executive of the Göppingen district

CONTRACT SIGNING IN GÖPPINGEN

A further agreement was reached in 2023 – this time in Göppingen: Energy utility Energieversorgung Filstal, the district of Göppingen and EEW signed a memorandum of understanding with the aim of increasing the heat yield from the thermal waste utilisation plant in Göppingen. A study was then carried out to determine if and under which technical, economic and legal conditions additional heat yield from the Göppingen plant can be achieved. The results were favourable and the plant is expected to deliver district heating to the neighbourhood of Ursenwang from 2025. The supply contract was signed in February 2024.

STUDY OF DISTRICT HEATING PROVISION IN HELMSTEDT

Helmstedt, which is also home to EEW's headquarters, is the location of the company's only thermal waste utilisation plant that exclusively produces electricity. This might change in future, as a feasibility study commissioned by the city determined that EEW's Buschhaus plant is the most appropriate partner to supply Helmstedt with district heating. There are currently preliminary deliberations about how the old town and two residential areas could be equipped with a district heating network, which would need to be linked to the EEW plant via a 10-km-long pipeline.

“
For me, science
and art are two
systems of curiosity.”

Sjoerd Knibbeler

EEW Art



Learn more about EEW Art:
www.lets-talk-about-tomorrow.com

At EEW, sustainability has long been a guiding principle for our business activity and conduct. And sustainability is a topic that touches us on many levels, speaking to our intellect, evoking emotions and fostering communication. That is why EEW has a tradition of inviting a photographer every year to explore the work of the company – and reveal new perspectives. In 2023, the invited artist was Sjoerd Knibbeler, a Dutch photographer born in 1981. In this conversation, he talks about his work with EEW.

Mr. Knibbeler, anyone who explores your work will come across terms such as science, experiments and nature. How would you describe your work and your working methods in just a few words?

For me, science and art are two systems of curiosity: asking questions and trying to find answers. The strategies and ways of working are also similar. Sometimes I encounter things that are incredibly complex and I try to put myself in the position of a scientist and then to translate these visually into pictures, ideally into art.

On a very practical level, how did you approach your work for EEW? What thoughts were guiding you?

I visited the EEW site in Delfzijl and I found it fascinating that you can really follow this entire process from the delivery of the waste to the transformation into energy, but you can't see the combustion itself. You can only look through a small window into the combustion chamber. And then, when we got to the end of the tour, there were these really big mountains of bottom ash and waste products. Sometimes the ash contains individual objects made of ceramics, glass and metal, which did not combust. These are traces of things that we used in our daily lives. Picking up these objects felt like collecting flotsam on the beach. In the studio, I rearranged various objects from this “beach flotsam” by size, shape and weight and photographed them as temporary sculptures. A second life!



Sjoerd Knibbeler studied photography at the Royal Academy of Arts in The Hague. His photographs, sculptures, video installations and art books are found in numerous corporate collections as well as public and private collections, including the Nederlands Fotomuseum, the Foam Photography Museum, the Dutch Ministry of Economic Affairs and Climate Policy and Ministry of Foreign Affairs. In addition, he has participated in numerous solo and group exhibitions. Knibbeler has also won several prizes and grants. He lives and works in Amsterdam.

EEW Art plays an important role in the company's own concept of sustainability, as does recycling. Do you see a connection between your work and the term sustainability?

Of course, there is an obvious connection. But I think there is also a deeper thought behind this, namely that we need to overcome many truly difficult problems right now. One of the things I want to do with this work – and in my work in general – is offer an opportunity to play. This means seeing things with new eyes and from different perspectives, so we can ask ourselves – and ideally others as well – questions. Dreaming is also part of this. These small sculptures that I created are one way.





01



02



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04



05

Left page:
Passant #09, 2023, 50 x 70 cm

Right page:
01 Passant #08, 2023, 50 x 70 cm
02 Passant #01, 2023, 50 x 70 cm
03 Passant #06, 2023, 50 x 70 cm
04 Passant #05, 2023, 50 x 70 cm
05 Passant #02, 2023, 50 x 70 cm



01



02



03



04

Right page:
Passant #15, 2023, 50 x 70 cm

Left page:
01 Passant #14, 2023, 50 x 70 cm
02 Passant #13, 2023, 50 x 70 cm
03 Passant #11, 2023, 50 x 70 cm
04 Passant #10, 2023, 50 x 70 cm





01



02



03



04

Left page:
Passant #19, 2023, 50 x 70 cm

Right page:
01 Passant #16, 2023, 50 x 70 cm
02 Passant #03, 2023, 50 x 70 cm
03 Passant #17, 2023, 50 x 70 cm
04 Passant #18, 2023, 50 x 70 cm

Health management: practical measures at our sites

As Health Coordinator, Sonja Lentz is responsible for health management at EEW. This includes both the process responsibility for the topics of health protection, occupational integration management and occupational health promotion. While occupational integration management focuses on helping employees to return to work after a long illness-related absence, health protection can include everything from occupational medical check-ups to psychological risk assessments, for example. The main goal of occupational health promotion is to strengthen and maintain the health of employees at EEW. This can be done with well-known instruments, such as cancer screenings, influenza vaccinations, addiction prevention and intervention initiatives, or programmes such as “fitness in the (home) office.” Moreover, subsidised gym memberships are available at some sites, and EEW offers further training in the form of seminars and e-learning. “The term ‘health’ here includes both physical as well as mental health. My responsibilities include supporting the sites with their own measures, which they plan and implement as part of our occupational health promotion activities,” says Sonja Lentz. And there are many such measures at all EEW sites, for example, in Stavenhagen and Schwedt.

”
The term ‘health’ here includes both physical as well as mental health. My responsibilities include supporting the sites with their own measures, which they plan and implement as part of our occupational health promotion activities.

Sonja Lentz
Health Coordinator at EEW

93.8%

health rate at EEW in 2023. In 2022, it was 93.3%.



”
There were three main areas: healthy nutrition, physical activity and anti-stress measures.

Nico Stein
Head of Operations at EEW's Stavenhagen site

**PILOT PROJECT:
HOLISTIC HEALTH CONCEPT IN STAVENHAGEN**

At the Stavenhagen site, EEW has taken an entirely new approach to health promotion: After the decision was made to actively strengthen the health of employees, the first step was conducting a questionnaire-based analysis with a partner firm at the end of 2022. The results were clear, as Nico Stein, Head of Operations at the Stavenhagen plant, reports: “There were three main areas: healthy nutrition, physical activity and anti-stress measures.” From this, we developed a programme that is diverse, needs-based and – most importantly – suited to shift workers. The offerings range from group cooking activities and workplace exercises using water bottles to relaxation techniques. The offerings were also adapted over time. The programme’s trainer also comes at 10 p.m., so even those on the late shift can take part – and this is also something the employees really appreciate, says Nico Stein.



**BIKE LEASING SCHEME JOBRAD
AT SCHWEDT SITE**

The better the conditions are, the easier it is to switch from a car to a bike. This is doubly true at EEW: For one thing, the company covers the costs of inspections and insurance for e-bikes and bicycles leased under the JobRad scheme. For another, the region around Schwedt an der Oder is quite flat and therefore ideal for cycling. So, it is no surprise that 19 of the 70 colleagues who work at the site are taking part in the programme. Schwedt’s participation rate of 25 per cent is the highest amongst all EEW sites. Michael Schulz, Electrical Engineering and Process Control Foreman and Chair of the Works Council in Schwedt, knows why the bike leasing programme has been so successful here: “We really did a lot of promotion for the JobRad scheme.” He cycles 10 km with his bike every day and is happy that a charging station for e-bikes is being installed on site.

”
We really did a lot of promotion for the JobRad scheme.

Michael Schulz
Electrical Engineering and Process Control Foreman and Chair of the Works Council at the Schwedt site



EEW GreenCoach: Sustainability requires strong teams. And teams require experienced coaches.

Sustainability efforts will only succeed if we work together and intensively communicate with each other. This is why we actively engage in continual dialogue with our employees, customers, suppliers, partners, public authorities, industry, policymakers and the scientific community. To strengthen our concept of “true sustainability through dialogue,” we are establishing our own, lively and easily accessible dialogue format: We are appointing our own ambassadors, known as EEW GreenCoaches.

WHAT DO EEW GREENCOACHES DO?

EEW's GreenCoaches take questions from interested citizens and help them to better understand the complex energy and climate policy challenges of our time as well as the importance and potential of waste management and the circular economy. They serve as intermediaries between the company and the public by making information accessible, answering questions and fostering an open dialogue. Their aim is to encourage people to actively explore sustainable concepts and take action themselves.



Scan the QR code to learn about the “För de Küste” coastal and environmental protection project of the THW Kiel handball club (in German only)



WHAT IS AN EEW GREENCOACH?

To ensure solutions are not “glued” to protests, there needs to be an open dialogue, the exchange of sound knowledge and know-how, as well as easy access to informed conversation partners. EEW GreenCoaches act on behalf of EEW, in other words “powered by EEW,” to engage stakeholders in dialogue and present various topics for discussion. They are motivated EEW employees who are open to questions on topics relating to sustainability, the circular economy and energy supplies, and can contribute knowledgeably to the conversations. Our EEW GreenCoaches help people to better understand complex topics. They also show how each individual can contribute on a day-to-day basis and give specific tips, such as how to properly separate waste or to save energy.

WHERE CAN THE EEW GREENCOACHES BE FOUND?

You can meet our GreenCoaches at various events, such as a plant tour at our sites, an open house day, at podium discussions, trade shows or even sporting events. We also collaborate here with partners who are working on initiatives and measures with positive social and environmental impacts. The EEW GreenCoaches made their debut with our sponsoring partner, THW Kiel. We had already supported the handball club with its coastline and environmental protection project “För de Küste.” On our website www.lets-talk-about-tomorrow.com, you can find out where the GreenCoaches are appearing next and request their appearance.

EEW GreenCoaches: Jana Bolze, electrical engineering trainer at the training centre in Helmstedt, and Carlo Exner, corporate communications employee

”

*Sustainability is a team game.
As in sport, every effort counts: even
small actions can lead to big changes.
As EEW GreenCoaches, we rely on open
dialogue to impart knowledge,
learn from each other and thus be
successful together.*

Carlo Exner

One of the first EEW GreenCoaches



Sewage sludge mono-incineration

A sustainable milestone for Mecklenburg-Western Pomerania

REGULAR OPERATIONS FROM 2024

There were a number of exciting developments at the sewage sludge mono-incineration plant at the Stavenhagen site in 2023: The first commissioning steps began in August and the first fire of sewage sludge started in October, preparing the plant for regular operations as of the second quarter of 2024. In future, around 15,000 tonnes of ash containing phosphates will be produced in Stavenhagen each year from 160,000 tonnes of sewage sludge. The heat from the plant will be used to supply district heating for the city of Stavenhagen and the combustion ash containing phosphates will be recycled to produce phosphorus for fertiliser production. "The sewage sludge will come primarily from Mecklenburg-Western Pomerania, but also partly from the northern part of the state of Brandenburg," explains Andreas Dous from EEW. The Sales Director adds: "This second sewage sludge mono-incineration facility is a milestone for us at EEW but also for the entire region around Stavenhagen." EEW has already signed contracts covering around 80 per cent of the plant's capacity. Dous is certain that the remaining 20 per cent will be filled quickly, as a statutory ban on using sludge from large-scale sewage treatment plants as an agricultural fertiliser will take effect from 2029. The ban was introduced because sewage sludge can be contaminated with many pollutants and plastics that should not be spread on fields. At the same time, however, the phosphorus contained in the sewage sludge must be reclaimed as a vital fertiliser. The construction of the new plant will create 10 to 15 additional jobs.

“*Thermal recovery of sewage sludge is a sensible and necessary addition to a sustainable waste management strategy for municipal sewage sludge. Besides providing a safe management option for sewage sludge not suitable for recycling it also makes a contribution to reducing fossil fuels and mineral phosphates, thereby conserving natural resources.*”

Stefan Breitzkreuz

Managing Director, ETH Umweltservice GmbH

2/3

of the total sewage sludge arising in Mecklenburg-Western Pomerania can be thermally treated at the Stavenhagen mono-incineration plant.



Transforming waste into a resource: The sewage sludge mono-incineration plant in Stavenhagen will start regular operations as of 2024 and supply district heating for the city.

Investments in the future

We invest in the modernisation of our existing energy-from-waste (EfW) plants to continuously improve our plant operations. Moreover, we also invest in the construction of new facilities to provide additional capacities for the safe and efficient utilisation of residual waste and sewage sludge. In this way, we strengthen the circular economy as well as ensure the long-term success of our company. In addition to the sewage sludge mono-incineration (SSI) plant in Stavenhagen, the following investment projects are currently being realised:

Start of construction	→	October 2021
Test operations	→	starting 1st quarter 2024
Regular operations	→	expected from 3rd quarter 2024
Throughput capacity	→	around 270,000 t/a residual waste
Thermal capacity	→	120 MW
Potential electricity production	→	up to 240,000 MWh (without process steam extraction)
Potential district heating production	→	up to 100,000 MWh
Potential process steam production	→	up to 240,000 MWh (with lower electricity production)
Additional jobs	→	approx. 35 full-time employees (together with SSI)



Expansion of Rothensee plant



Rothensee SSI plant



Start of construction	→	October 2021
Test operations	→	starting 1st quarter 2024
Regular operations	→	expected from 3rd quarter 2024
Throughput capacity	→	around 55,000 t/a of sewage sludge original substance
Thermal capacity	→	3.7 MW
Additional jobs	→	approx. 35 full-time employees (together with EfW)



Start of construction	→	July 2022
Test operations	→	expected from 4th quarter 2024
Regular operations	→	expected from 3rd quarter 2025
Throughput capacity	→	around 185,000 t/a of sewage sludge original substance
Thermal capacity	→	18 MW
Additional jobs	→	approx. 10–15 full-time employees



Delfzijl SSI plant



Replacement new build Stapelfeld EfW plant



Start of construction	→	May 2021
Test operations	→	expected from 4th quarter 2024
Regular operations	→	expected from 2nd quarter 2025
Throughput capacity	→	around 325,000 t/a residual waste
Thermal capacity	→	120 MW
Potential electricity production	→	up to 200,000 MWh
Potential district heating	→	up to 400,000 MWh



EfW = Energy from Waste, SSI = Sewage Sludge Incineration

Let's talk **about**:tomorrow

Overcoming challenges, shaping the future

From the past and the present, the future emerges. And our goal for the future is: net zero CO₂. For EEW, this will not be achievable in one leap, with one technology or one large investment. It will require many individual, complementary measures which in combination take us towards our goal. This is a view shared by Jörn Jakob, Head of Innovation at EEW. He coordinates the operations of an innovative CO₂ capture demonstration plant at the EEW site in Hannover. He sees this facility as a milestone on EEW's journey into the future – and one of many initiatives that will contribute to reaching our net zero CO₂ goal.



Find out more online:
www.lets-talk-about-tomorrow.com



Jörn Jakob
Head of Innovation at EEW

MasterPassport: *Developing leaders and fostering an understanding of leadership*

Leadership positions demand a lot from employees – and not just expert knowledge and skills. They must also be able to meet complex challenges and deal with difficult conversations and conflicts. This is why EEW several years ago launched the Leadership Passport, which is achieved by completing various learning modules. Since 2023, we have also offered the MasterPassport, which was specially developed for shift managers and plant employees who have attained “Meister” (“Master”) trade qualifications.

EEW's MasterPassport supports both talented young employees and more experienced colleagues on their journey to the management level.

However, this programme is not only aimed at shift managers and their deputies. It is also targeted at talented young employees as well as “old hands,” as Caterina Panzarino from EEW's Human Resources department explains: “We are reaching out to aspiring managers who will take over leadership positions in the future, as well as employees who have been with us for a long time and would like to ‘polish up’ their skills. Overall, the first cohort is a very mixed bunch and we are happy about that.” Various criteria come into play when selecting the participants because factors such as generational succession must always be taken into consideration. However, the necessary potential as well as the current position of the individual employee are ultimately decisive, according to Caterina Panzarino.

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The MasterPassport modules give us new insights into our own work and are simultaneously very helpful in daily life.

Hikmet Taspinar

Power Plant Foreman and Shift Foreman at the Göppingen site.

The first MasterPassport course with 26 participants from various EEW sites launched in 2023 with a kick-off event that lasted for a day and a half. Then, over the course of the year, participants completed six modules lasting two days each. A seventh module can be freely chosen, and can cover special topics such as labour law, moderation or managing apprentices.

According to Caterina Panzarino, the results of the first MasterPassport course were exceptionally positive: “There was a very, very good mood among the first MasterPassport cohort. All participants recognised this was an excellent opportunity to gain further qualifications. With the MasterPassport, we are also coming closer to our goal of developing a common understanding of leadership at EEW.” And there are already firm plans to offer this training programme again in the years 2024 and 2025: 22 employees will be starting in the second round.



26 employees attained the first MasterPassport

MASTERPASSPORT MODULES

1. Confident & hands-on leadership
2. Master of my trade
3. Clear and goal-oriented communication
4. Identifying and successfully resolving conflicts
5. Effective leadership of employees with healthy self-management
6. Team leadership 101
7. Individual choice

”
I am very happy that there is now a further training programme specifically for those of us working in the plants.

Marcel Kimmel

Team Lead, Work Preparation and Storage at EEW site TRV Buschhaus

3D scan of our plants

Digital models for a more sustainable future

DATA FORM THE BASIS FOR MANY PROCESSES

Digitalisation and sustainability are closely linked because digital processes can improve efficiency and therefore save resources, energy and time. Processes and collaboration – including with partners and customers – are therefore being increasingly digitalised at EEW. We focus especially on our plants because a data-based approach is required to optimally assess and manage the complex technical processes.

The advancement of digitalisation in the plants is evident in a project which scans all the facilities in 3D – from outside and inside and from top to bottom. With this data, we can recreate digital 3D models of the plants. “This enabled us to offer virtual tours of the Göppingen site during the coronavirus pandemic, taking the guests on a walkabout via their screens,” says Charleen Peter, Project Manager in the digitalisation team at EEW. On tours with virtual reality headsets, which are offered at trade shows, for example, guests can make their own way through the 3D model. At various points, they can access information in text or video form.

The technical process of digitalisation is not all that complex in this case, according to Charleen Peter: “An employee from the contractor firm goes through the plant with a 360° camera and films all of the rooms. How long it takes depends on the size of the plant, but from the first recording until the finished model, it is no more than a week.” So far, this data has been collected and processed for 11 of the 17 plants, and others are in the making.



External partners who carry out work for us can get a first impression of our plant without having to set foot on site. This saves time and costs and helps us to further shrink our CO₂ footprint.

Detlef Nickel

Head of Maintenance at EEW's GroBräschen site



Here you can find more information about the 3D scan project at the TREA Breisgau site (in German only)



The digital twin will become a smart, digital live copy of our plant, where we can directly access all kinds of technical information.

Charleen Peter

Project Manager in the digitalisation team at EEW



NEXT STAGE: DIGITAL TWIN

Although it might initially sound like a complex technical gimmick, in future this will bring EEW significant economic and sustainable advantages. Detlef Nickel, Head of Maintenance at the GroBräschen site, gives one example: “External partners who carry out work for us can get a first impression of our plant without having to set foot on site. This saves time and costs and helps us to further shrink our CO₂ footprint.” Another possibility is that new plant components can be digitally tested and adjusted.

But there is even more potential in the future: The visionary idea is that the 3D models can become “digital twins” of the real plants. With these, it will one day be possible to virtually move around the plant and call up various data in real time, which are recorded by sensors or cameras. All of the relevant information – ranging from process, technical and economic data – would then be available for any virtual point in the plant. The digital twins can be supplemented by “co-working robots,” which can independently make their way through the plants and provide additional real-time data and images. They can, for example, capture thermographic images of the large machinery units in order to identify changes. Charleen Peter, Project Manager in the digitalisation team, sums it up: “The digital twin will become a smart, digital live copy of our plant, where we can directly access all kinds of technical information.”

Research and development

EEW on the path to a sustainable future



Running a sustainable business requires constantly reevaluating priorities, yet EEW's primary focus remains providing reliable and safe treatment services for residual waste and sewage sludge as well as a secure supply of environmentally friendly energy. The thermal utilisation of non-recyclable waste does result in almost unavoidable emissions such as CO₂, but innovative technologies like CO₂ capture and increasingly efficient plant operations show there are ways that emissions can be reduced. Despite efforts to recycle plastics, the thermal utilisation of residual waste is still necessary. In 2023, EEW continued to pursue research and development, for example, in Hannover, Großbränschen and Delfzijl, to advance topics such as CO₂ capture, energy efficiency and the circular economy.

Test operations:

Lower CO₂ emissions for the atmosphere

Until now, the production of energy on a large scale has very often been associated with CO₂ emissions. An obvious idea is to capture this carbon dioxide and prevent it from entering the atmosphere – and this is technically possible. So far, this has primarily been done using amine scrubbing. But amine scrubbing has a major disadvantage: It is very energy-intensive.

The Norwegian firm Capsol has developed a process that takes a different approach: It captures CO₂ with potassium carbonate, also known as potash. To test the new technology, EEW had a Capsol demonstration unit installed at the Hannover site. This facility, which is 18 m high and weighs 27.7 tonnes, can capture between 1-2 tonnes of CO₂ per day from a flue gas stream of 300 m³ per hour. Jörn Jakob, Head of Innovation at EEW, explains the advantages of the Capsol technology: "This technology can be very flexibly deployed according to the various energy production profiles at EEW's plants. At the same time, potassium carbonate is not harmful to humans or the environment, and it is readily available." Inside the unit's absorber, the CO₂ from the flue gas comes into contact with a potassium carbonate solution

under pressure and gets bound in the solution. The potassium carbonate solution containing the CO₂ is then transferred to the desorber, where the CO₂ is released again in a lower pressure environment. Finally, the CO₂ can be processed for further use.

When the demonstration project comes to an end in 2024, there will be a wealth of findings about this new technology, including technical, environmental and economic aspects. Or, as Jörn Jakob says: "This project is not just a demonstration initiative for us; it is a glimpse into a possible future."

Marcel Callegari, Project Lead Innovation at EEW shows off the heart of the facility





Marcel Callegari, Project Manager Innovation at EEW



Watch the film about carbon capture (in German only)

”

In this months-long pilot project, we will gain important experience with this technology, which will also help us within the EEW Group to prepare for the operation of a large-scale capture facility.

Marcel Callegari
Project Manager Innovation at EEW

”

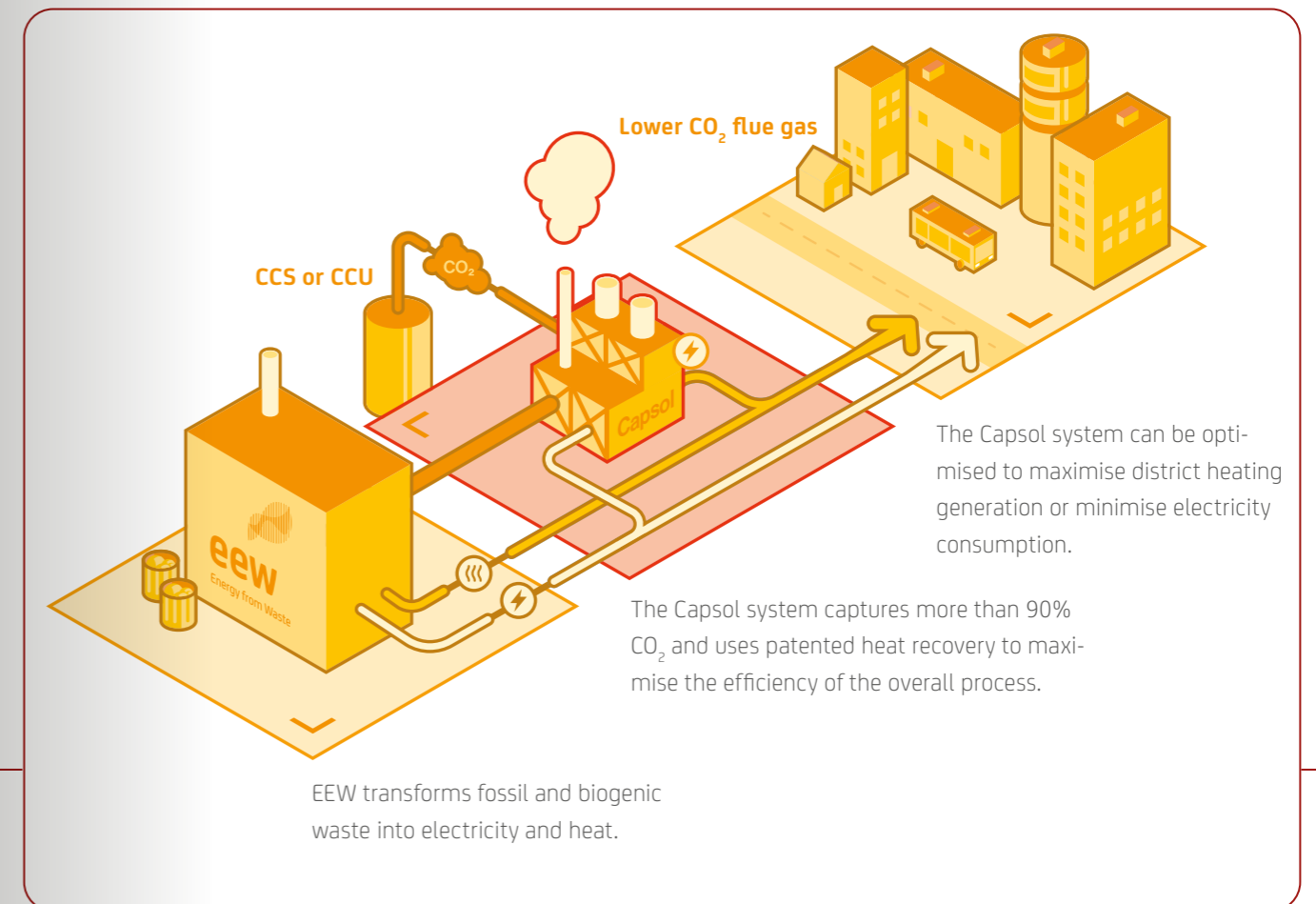
We are pleased to have launched this collaboration with EEW, one of the largest thermal waste utilisation companies in the country. These are clear signs that the German market is seriously preparing for the use of industrial-scale carbon capture and that our energy efficient and environmentally friendly technology is competitive.

Philipp Staggat
Chief Product Officer, Capsol Technologies

CO₂
↓↓↓
1-2

tonnes of CO₂ will be captured per day with the pilot plant

Our graphic shows in simplified form how the pilot project works



More energy: *through efficiency and innovations*

Energy utility Stadtwerke Senftenberg and EEW signed a contract in 2023 that should help to decarbonise the future heat supply for residents of the city of Senftenberg. Under this agreement, EEW's Großräschen site will supply up to 80,000 MWh of industrial waste heat annually to Stadtwerke Senftenberg through a 10-km-long district heating pipeline as of 2026.

This project has a total investment volume of around €33 million. By bypassing fossil fuels, this agreement could result in the avoidance of up to 19,000 tonnes of energy-related CO₂ emissions per year. Both sides will be able to build on a successful collaboration: Over the past 14 years, EEW's especially efficient combined heat and power (CHP) thermal utilisation plant has provided a total of around 40,000 MWh of environmentally friendly district heating to the local network in the Großräschen neighbourhood of Freienhufen. An additional 80,000 MWh per year will soon be delivered to Stadtwerke Senftenberg.

As part of this project, EEW is also investing in innovative technologies for new energetic optimisation. According to current plans, this will include an absorption heat pump. This equipment uses steam instead of electricity as a source of operating power for the thermal compression of steam. The heat will be extracted from the turbine's exhaust steam, which until now has been released into the atmosphere through air condensers. Using absorption heat pumps in this way will be a first in Europe.

In addition, there is further potential to increase energy efficiency. With technical optimisations, for example, in flue gas cleaning or the use of battery storage media, the plants' energy efficiency can be increased even more.



”

By using an absorption heat pump, we can exploit previously untapped potential for district heating extraction.

Christian Schüttenhelm
Project Manager Innovation at EEW



Innovative technology: an absorption heat pump - a step towards decarbonising the heat supply

The process of flue gas condensation to capture pollutants also produces water and energy with previously untapped potential. In the first step of this process, the flue gas gives off heat in the stacks when it is cooled down from 135°C to around 40°C using water. The condensed water then pools on the floor of the stacks. As the water is diverted out of the stacks, it is cooled further to around 27°C. This thermal energy is used to produce district heating. This process reduces pollutant emissions and increases energy efficiency at the same time.

Moreover, battery-based solutions will be able to store electricity to help stabilise the grid, while thermal reservoirs will hold hot water to manage supply at peak times. In this way, EEW is supporting the feed-in of energy from renewable sources such as wind and solar.



80,000

MWh of industrial waste heat to be supplied annually to Stadtwerke Senftenberg from 2026

Energy optimisation at the Großräschen site



Recycling:

Pre-sorting plant enables separation of plastics and reduces CO₂

In future, EEW will be able to sort and separate plastics from the residual and commercial waste streams delivered to its site in Delfzijl, Netherlands, so the plastics can be recycled. Until now, EEW Group has focused exclusively on safely and efficiently thermally utilising the waste delivered to its plants. This pre-sorting process will make it possible for the recyclable plastic fraction contained in waste deliveries to enter back into circulation. The residual waste delivered to EEW is made up of roughly 50 per cent fossil-based material.

With this pre-sorting plant, EEW will divert the plastics from thermal treatment. Downstream recycling processes will close material loops, thereby conserving resources and reducing fossil CO₂ emissions.

The planned facility at EEW's site in Delfzijl, located in Groningen province in the northeast of the Netherlands, will also be serving as a trial run. Here, EEW wants to gain experience with a view to finding the optimum scale and thus generating the greatest possible benefits for climate and environmental protection.

EEW intends to start up the facility to separate various material streams in mid-2026. The heart of the plant will be a system of near infrared sensors that can recognise various material types. At the beginning of the process, the waste stream will be pre-shredded and separated by size in a rotary screen, since ensuring that the waste is not too large or too small is crucial for a good sorting output. Conveyor belts will then carry the waste to the next step of the sorting technology, the ballistic separator, where it will be separated into flat 2D and rigid 3D materials. The streams will then pass through several near infrared sensors. These can recognise readily recyclable plastic grades, such as polyethylene (PE),

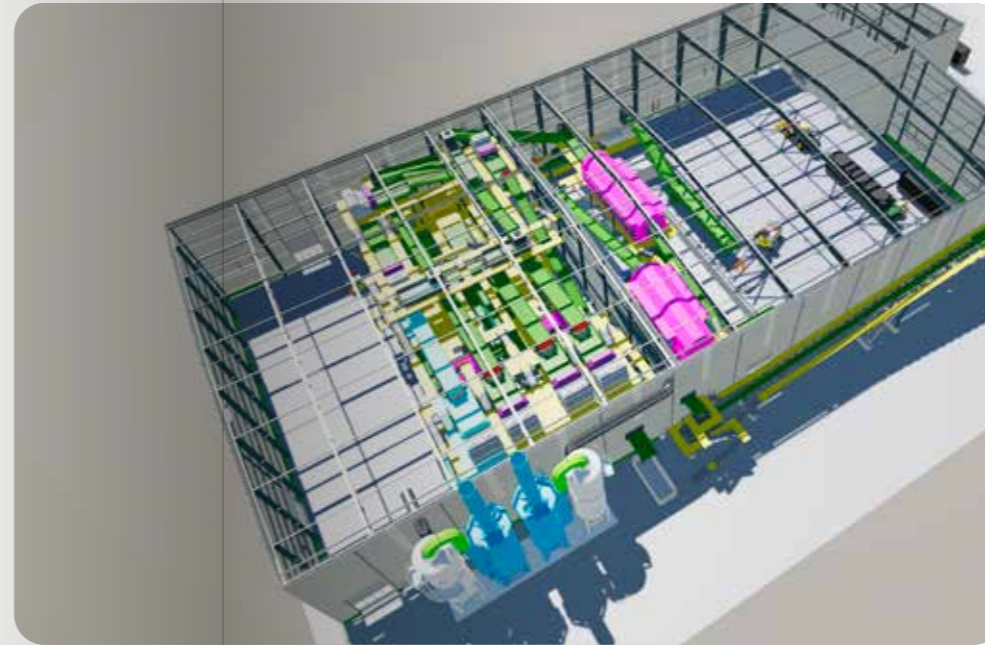
polypropylene (PP) and polyethylene terephthalate (PET). Plastic film will be discharged from the 2D stream and rigid plastics in the 3D stream will be separated into single-polymer fractions. If a target fraction is detected by the near infrared machine, a highly accurate jet of compressed air will blast the material from the conveyor band into the appropriate collection container. Finally, the plastic fractions will be pressed into bales and then made available as an input material for downstream recycling processes, either mechanical or chemical recycling. In this way, EEW also contributes to conserving primary raw materials.



With this plant we will broaden our activities along the value chain. As a result, we ensure that the waste delivered to us can be recovered in the best way possible in line with the circular economy.

Inga Fischer

Project Lead, Business Development at EEW



A glimpse into the future: This 3D model shows the pre-sorting plant planned for the Delfzijl site.



is the expected start-up date for the new pre-sorting plant

Once the facility is up and running, it will be able to process up to 150,000 tonnes of waste prior to thermal utilisation to find recoverable recyclates – every year. Inga Fischer, Project Lead Business Development at EEW, expects that “around 10 to 15 per cent of the waste input consists of plastics”.

To give an idea of the size of the future facility, the footprint of the building measures around 50 m by 100 m. It will be connected to an outdoor conveyor belt to transport the residue fraction to the existing thermal waste utilisation plant.

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