ACHEMA 2024

Engineering-Times

EXTRA!

PÖRNER GRUPPE · EDL PÖRNER GRUPPE

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Ensuring Project Success Through Security

IMAGE: IMAGECREATOR | ADOBE STOCK | SOLVR.VISION

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Dear Customers, Partners, and Friends,

Our times are marked by significant upheavals in politics and society, with an economy undergoing a massive transformation. Concurrently, AI and emerging technologies are flooding the market, altering our (working) lives. All this leaves us with a sense of uncertainty.

It is all the more important to rely on constants. The Pörner Group is such a constant. For over 50 years, we have successfully executed over 2,000 projects across various industrial sectors. These projects demonstrate our ability to combine proven methods with the latest technological developments to deliver reliable results. Numerous factors provide security for a successful project with Pörner.

Security through Practical Competence

With corporate revenue exceeding 80 million euros, corresponding to plant investments of approximately 400 million euros, we have an annual working capacity of around 750,000 hours to implement complex and large-scale projects successfully. At Pörner, the focus is always on practical orientation and the most significant benefit for the customer. We not only offer consulting but also take full responsibility for the realization of plants: comprehensive, from a single source. Under our "Anlagenbau 4.0" principle, we aim to set industry benchmarks with efficient matrix project organization and intelligent solutions.

Security through Digitalization and Networking

Using integrated database systems and networked software tools is essential for planning process plants. The comprehensive planning with the latest software and data-centric connections must continually be optimized. Therefore, Pörner strongly emphasizes "customization" and in-house developments like the "Pörner Integration" (more on this on page 3).

Optimal networking and digitalization are indispensable in today's ever-shortening project turnaround times, not only for economic reasons but also to systematically avoid potential errors due to a lack of coordination.

Security through Progress

The Pörner Group combines experience with innovation and progress. Since the turn of the millennium, we have been actively shaping the "green" transformation. We look beyond the energy transition towards a comprehensive resource transition and higher-value specialty products, incorporating renewable or recycled raw materials. The trend towards smaller to medium-sized plants for sustainable niche products fits well with our focus on projects ranging from 10 to 100 million euros and the reconstruction of large plants. Our priorities include optimized capacities, energy savings, maximum automation, environmental protection, and safety.

Security through Research and Development

As a mid-sized corporate group, we focus on new process solutions for alternative energies and materials such as bio-silicates from rice hull ash with a 70% CO_2 reduction and PtX (Power-to-X), e.g., the HyKero process for producing sustainable aviation fuels, and BtX (Biomass-to-X) through pyrolysis. Our expertise in bitumen application technology is globally renowned. With a research ratio of three percent, we are well above the SME average. Five in-house pilot plants and over 50 highly qualified process engineers ensure that we can continue to offer modern technologies in the future.

Security through Creativity

Our successes are based on our highly qualified engineers and specialists. They are our most valuable resource. By fostering employee satisfaction and social interaction with individual freedom, we create the necessary climate for creativity and, thus, project success. Intelligent work must take precedence over routine in times of transformation!

Conclusion

We are passionately committed to realizing "green" projects and conserving resources. With proprietary Pörner technologies and in-house developments within the digitalization framework, we offer our customers concrete added value. Ultimately, the "color" of the project does not matter – projects are and remain projects that must always be managed equally well to be successful.

To achieve this, we stand firmly by your side as always.

PHOTO: PHILIP SIMONIS

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Pörner and EDL at ACHEMA 2024

FRANKFURT/MAIN. Pörner and EDL present their over 50 years of plant engineering and technology expertise at ACHEMA under the motto

"Embrace the Power of Change - Let's engineer game-changing ideas."

The contribution that plant engineering can make to the transformation of industry will undoubtedly be of great interest to the approximately 77,000 visitors expected at the fair. Pörner and EDL have been focusing on this topic since the turn of the millennium and will present their results and services at their booth in **Hall 9.0 E13** and in four lectures within the congress program and on the Innovation Stages. Topics to be presented include :

1. solutions for Power-to-X and hydrogen up to PtL-SAF production on an industrial scale,
2. sustainable BtX concepts with biomass torrefaction and biosilicate production,
3. Pörner Group's decades of specialization in plant revamps based on Anlagenbau 4.0 principles to increase productivity and sustainability, and
4. "Pörner Integration" to optimize detail engineering in plant engineering.

For one week, manufacturers and service providers from more than 50 countries present their products in the fields of energy and environment, chemistry, pharmaceuticals, and biotechnology in Frankfurt. ACHEMA is the world's leading trade fair for the process industry. Since 1920, it has been bringing together experts, qualified users, and interested parties worldwide. Visitors can admire the LEGO model of a Biturox® bitumen plant and relax with a cup of freshly-brewed Melange on the Viennese Café terrace. ■

POWER2X
EDL·TECHNOLOGY

POWER-TO-X AND HYDROGEN

Monday, June 10, 2024, 3:30 p.m.
Hydrogen Innovation Stage

Hall **6.0**

Dr. Michael Haid (CEO of EDL) will give a lecture on **"Production of PtL kerosene (eSAF) on an industrial scale in the context of a closed regional hydrogen value chain."** He will introduce the HyKero project as part of the joint project 'LHyVE' in Leipzig. The LHyVE project aims to establish a closed hydrogen value chain in the Leipzig region. The HyKero plant is expected to produce 50,000 tons of PtL-SAF and green hydrogen annually, making it the largest plant of its kind worldwide.

PHOTO: PHILLIP SIMONIS

ANLAGENBAU 4.0
we create productivity

ANLAGENBAU 4.0

Monday, June 10, 2024 3:00 pm
Granat

Hall **11.0**

Plant (re)design projects are very complex and require, among other things, the use of state-of-the-art IT software for cost-effective and rapid implementation. However, the software products available on the market have gaps in the workflow. Pörner has therefore, among others, developed the "Pörner Integrator". Christian Steinkellner and Roman Schreiner, Senior Piping Engineers at Pörner Vienna, will present the in-house development as part of the lecture **"Anlagenbau 4.0: Optimization of detailed planning through digital integration - The digital path from component specification to the construction site"**.

REVAMPED
BY PÖRNER GROUP

SMART ENGINEERING

Thursday, June 13, 2024, 12:00 p.m.
Process Innovation Stage

Hall **9.0**

Andreas Pörner, Group Managing Director, will give a general overview of the smart engineering of plant revamps in his presentation **"Smart Engineering: How plant revamps increase productivity, efficiency, and sustainability according to the principles of Anlagenbau 4.0"**. With over 60 successful large-scale revamps, Pörner Group has a wealth of experience in this area. Pörner will explain how relatively inexpensive plant revamps can increase production based on economic and ecological parameters and how even small changes can have a significant impact.

PHOTO: PHILLIP SIMONIS

SILICATE
PÖRNER RICE HULL TECHNOLOGY

SUSTAINABLE PLANT ENGINEERING

Thursday, June 13, 2024, 4:30 p.m.
Green Innovation Stage

Hall **6.0**

In the field of innovative sustainable technologies combined with proven methods, Gerhard Bacher, Managing Director of Pörner Germany, will give a technical presentation on **"The pioneering example of a green process chain from torrefaction of biomass via pyrolysis to syngas combined with the production of valuable bio-silicates from rice hulls."** The process uses rice hulls, a biological waste material, to produce energy, syngas, and bio-silicates for the silicate industry. With Pörner's bio-silicate process, the CO_2 footprint can be reduced by 70 percent compared to conventional high-temperature production methods.

PHOTO: PHILLIP SIMONIS

Advanced Flue Gas Desulfurization Plant

ENVIRONMENTAL PROTECTION. EDL completes EPCM project for Gunvor Raffinerie Ingolstadt after three years.

LEIPZIG. Stricter legal requirements for sulfur dioxide emissions were the impetus for Gunvor Raffinerie Ingolstadt (GRI) to initiate the MINERVA (Modern INgolstadt Emissions Reduction Via Amine) project. The project covered planning and construction of a flue gas desulfurization plant and its integration into existing plant facilities. The project was implemented as part of the BVT (Best Available Technology) environmental initiative with the aim to efficiently reduce sulfur dioxide emissions. For this purpose, the refinery selected a process from one of the world's leading energy companies. This process converts the separated sulfur dioxide (SO_2) in the existing Claus plant into elemental sulfur, which is provided as a chemical precursor for the industry.

> "I would like to thank everyone involved very much for the excellent cooperation."
>
> Matthias Haring
> Project Manager EDL

Plant engineering and construction supervision – Made by EDL

In 2020, Gunvor Raffinerie Ingolstadt commissioned EDL from Leipzig with a pre-basic engineering, and in 2021 with the execution of the front-end engineering design (FEED), including a cost estimate as well as the detail engineering for long lead equipment items. After this project phase had successfully been completed, EDL also received the order for the detail engineering and construction supervision of the flue gas desulfurization plant. In 2022, detail engineering was completed for the most part.

The first construction activities in the FCC plant area started in the winter 2021/2022. They were extended to include the hydroskimming plant area in spring 2022. The first equipment items were installed in spring 2023 as part of the scheduled turnaround. The flue gas desulfurization plant was accomplished in the first quarter of 2024 and is now being commissioned stepwise by Gunvor Raffinerie.

EDL's Project Manager Matthias Haring summarizes: "The very fruitful and good cooperation with the customer GRI pulled its weight to an efficient elimination of technical problems and obstacles that occurred. Planning during the Corona pandemic, bottlenecks on the global market, and challenging transport routes imposed high requirements on all parties involved. Due to a lack of capacities among assembling companies and contractors, the implementation was difficult. Looking back, however, we can state that the team, consisting of specialists from EDL and GRI, faced these challenges and achieved a good result."

Fit for the future thanks to the MINERVA project

MINERVA is the largest individual project at Gunvor Raffinerie Ingolstadt GmbH. In addition to significantly reducing SO_2 emissions, the refinery also increases flexibility in the crude oil selection to strengthen its international competitive position. With the implementation of this project, environmental regulations will permanently be met at the Ingolstadt location. ■

PHOTO: GUNVOR RAFFINERIE INGOLSTADT

Lifting of the lower column section – diameter 5.8 meters, length 19.1 meters, weight 52 tons – onto its foundation.

PHOTO: GUNVOR RAFFINERIE INGOLSTADT

▶ Installation of one of two Venturi scrubbers

PHOTO: GUNVOR RAFFINERIE INGOLSTADT

▶▶ The upper section of the column – 44 tons in weight and 14.9 meters long – was installed and completed with the 38-meter-long and 23-ton heavy smokestack.

Digitalization In Plant Engineering: In-house Development "Pörner Integration"

VIENNA. Pörner is continuously advancing the digitalization of plant engineering and has developed a new tool for more efficient planning of process plants: the "Pörner Integrator."

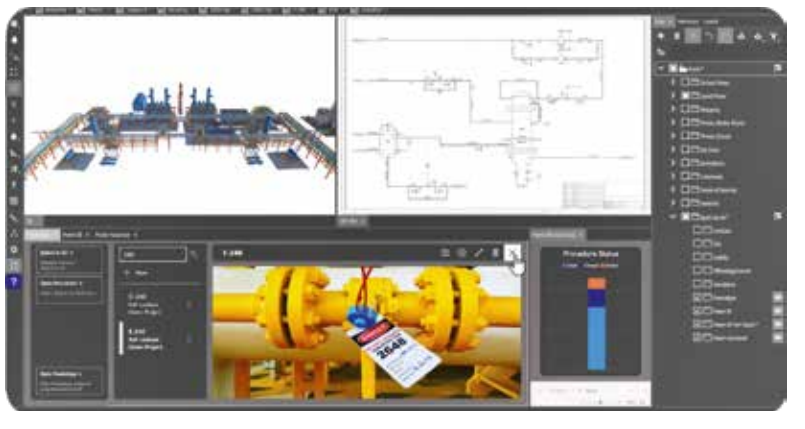
It is well known that modern plant engineering requires integrated database systems and networked software tools. However, the products available on the market often have gaps in the workflow. Therefore, Pörner relies heavily on in-house developments.

The "Pörner Integration" was implemented - a tightly networked landscape of multi-discipline planning software for plant engineering, starting with pipe classes and component specifications through 3D planning to materials management. Data-centric interfaces make the same database available for implementation on the construction site.

The continuous data flow between the individual tools within the "Pörner Integration" enables a permanent, automatic data synchronization in different project phases, reduces data redundancies and error sources, and thus increases the quality of planning and quality control.

A tool of the "Pörner Integration" is the "Pörner Integrator". It uses, among other things, P&IDs in PDF format and the 3D model or a point cloud with a background database containing all critical attributes of the plant components. Process plant engineering is now much more transparent, faster, and more reliable thanks to the systematic integration of the workflows of the various disciplines, thus continuously improving quality. ■

In the future, it will also be possible to link PDF schematics with point clouds or 3D models in the 3D Viewer using Pörner Tagging. This creates a Digital Twin Lite that can be used early in projects.



TRANSPORT AND INSTALLATION OF THE LARGEST EQUIPMENT ITEM

After thorough investigation of the transport route and obtaining the necessary permits, the shipping company set off with the column (diameter 5.8m, length 33.5m, weight more than 100 tons) from Lower Rhine to Ingolstadt at the end of October 2022 – first by riverboat on Rhine, Main and Main-Danube Canal to Kelheim, from there as road transport to the refinery. Aside from the usual difficulties with narrow town passages, the extremely low water levels were also challenging.

In summer 2023, after completion of the required foundations, concrete, and steel structures, the large equipment items were lifted into place. The two Venturi scrubbers to be mounted on the right and left of the column were installed first. Then the lower section of the column (diameter 5.8m, length 19.1m, weight 52 tons) was placed on its foundation. Only one day later, the upper section of the column (length 14.9m, weight 44 tons) was added, and the two halves of the column were welded together. Afterwards, a 38-meter-long and 23-ton weighing smokestack was put on. With a total height of 83 meters, this structure is now a prominent landmark of the refinery.

▼ Transport of the column - 33.5 meters long, more than 100 tons in weight, with a diameter of 5.8 meters - by riverboat on the Rhine, Main, and Main-Danube Canal to Kelheim.

◢ The second part of the heavy goods transport – by road.

State-of-the-Art Hydrolysis Plant

CHEMISTRY. Pörner completes a three-and-a-half-year EPCM project for LAT Nitrogen's melamine plants.

LINZ. LAT Nitrogen Linz GmbH operates two melamine production plants in the Linz Chemical Park. A new state-of-the-art wastewater treatment plant was built for both plants. LAT Nitrogen (Borealis Agrolinz Melamine GmbH until July 2023) awarded the EPCM contract for this project to Pörner in Linz in March 2020. The contract included authority engineering, extended basic engineering, detail engineering, project management, scheduling, procurement support with expediting, construction supervision, and commissioning support. The total investment cost of the upgrade was approximately EUR 42 million. The new thermal wastewater treatment plant has been in full operation since the end of July 2023.

▲ The hydrolyzers are loaded for sea transport in Mumbai, India.
▶ Plant site before modernization.
▼ Plant site after modernization.

State-of-the-art wastewater treatment

The project started with the dismantling of 1,500 tons of material from two decommissioned melamine plants, followed by the construction of a new treatment plant for the process wastewater from the operating melamine plants 4 and 5. Pörner once planned melamine plant 5 with demanding process parameters (175 bar pressure and over 400 degrees Celsius temperature).

The melamine plants process urea into melamine. The "process wastewater" was previously treated using two existing thermal wastewater treatment plants. A new wastewater treatment plant was built with a 1,000 cubic meter double wall tank. It consists of two pressure units (hydrolyzers) connected in series. They split organic nitrogen compounds into ammonia and carbon dioxide at an operating pressure of 45 bar and an operating temperature of over 230 degrees Celsius. A stripper removes the dissolved ammonia from the wastewater, which is then recirculated to the process as an ammonium carbonate solution. The purified "process wastewater" is re-cooled via heat exchangers and discharged into the cooling water channel after all limits have been checked.

Two superlatives on their way from Mumbai to Linz

The two hydrolyzers, weighing 180 tons and measuring 37 meters in length each, were transported by sea from Mumbai, India, to Linz, Austria. The challenge on site was to place the two hydrolyzers on the five-meter-high foundation strips, which was accomplished using a special hydraulic lifting and moving system. In total, 40 pieces of equipment, 8,100 meters of piping, 3,600 flanges, 3,700 bends, 2,000 fittings, and 300 EI&C field devices were prefabricated, installed, and tested in the new plant. Pörner project manager Harald Grünberger sums up: "It was an exciting three and a half years from dismantling to construction to commissioning. After very demanding weeks, the hydrolysis plant was handed over on time. We are delighted that LAT Nitrogen can now produce melamine in compliance with all environmental regulations!" ■

> "We are delighted with LAT Nitrogen that the plant is now running as planned!"
>
> Harald Grünberger
> Pörner Project Manager

Read more on our website

Pörner Speeds Up On Go-Kart Track.

TEAMEVENT in Linz to kick off sponsorship.

LINZ. For one year, the go-kart track in Linz will shine in the Pörner design, and a specially designed Pörner car will provide a unique racing feeling on the track. "Our team is doing an amazing job! Here, we can find a balance together to work and at the same time get into conversation with business friends and potential applicants", says branch manager Markus Obermayr about the sponsorship.

The Pörner office in Linz is setting a unique example in the fight against the shortage of skilled workers by sponsoring the kart track. The sponsorship started with a team event in November 2023, where Pörner employees participated in an exciting race on the e-kart track. It was a memorable afternoon that ended with a relaxed BBQ and drinks in the karting hall. ■

Bitumen - The New Green Black

Bitumen is and remains - especially in times of climate change - the indispensable building material for road construction and an ideal insulator against moisture and water. This inexpensive natural product has been used since time immemorial.

MOST AFFORDABLE "NATURAL MATERIAL"
The outstanding quality results from its visco-elastic, thermoplastic properties, as the mixture of 1,000 components conforms to the surface with plasticity and adhesion.

CLIMATE FRIENDLY Even the production process produces drastically less CO_2 than the production of Portland cement for concrete roads.

RECYCLING Today, Bitumen is reused two to three times - even on-site - mixed with a fresh binder during road repair.

MATERIAL INSTEAD OF FUEL It is well known that crude oil is mainly processed into fossil fuels and combustibles, ultimately leaving enormous traces of CO_2 in heating systems and engines. In particular, the heavy residue from crude oil distillation often ends up in old power plants and ship engines worldwide. However, if bitumen is produced from the residue, it becomes a sustainable building material - efficient road networks save time and mobility energy, and dense dams hold water for entire cities - the carbon they contain remains bound.

SUSTAINABLE Refined to a high-quality standard by gentle exothermic Biturox® oxidation with minimal energy input, bitumen is used as an easily processable, recyclable material for durable roads. A significant advantage is the ease with which bitumen roads can be repaired: modern asphalt paving machines can renew the surface almost "just in time - on the spot." On heavily trafficked roads, such as the Vienna Southeast city highway, a prolonged closure for installing concrete pavements is entirely unthinkable.

ECONOMIC CONVENIENCE Bituminous roads are the cheapest in terms of "total cost of ownership" (the total cost per kilometer per year) calculated over decades - and travelers prefer the joint-free, tire-friendly driving comfort.

Will bitumen be around in the future?

Much of the world's oil reserves are heavy oils. Even if the proportion of petroleum used as fuel decreases due to electric mobility - good bitumen will remain available for first-class roads. ■

LEGO masterpiece

Pörner Kyiv builds Biturox® plant to scale from 31,000 bricks.

BITUROX®
BITUMEN OXIDATION TECHNOLOGY

KYIV. In the world of engineering, there are always extraordinary projects that require technical skill and a good dose of creativity and perseverance. The creative minds at Pörner Kyiv recently realized one such task: the replica of a Biturox® bitumen plant made of over 31,000 LEGO bricks for our ACHEMA presentation. The circumstances under which it was built are impressive. Our colleagues in Kyiv were undeterred by the extremely difficult conditions caused by the ongoing war and power cuts in the region.

Using 3D software, they planned each step professionally, as engineers should. After a month of meticulous assembly and gluing, all the stones were in place. Transporting the two-meter-long, 1.20-meter-wide, 1.15-meter-high LEGO model proved as adventurous as assembling it. Divided into three parts, the fragile model was sent on its journey. In time for the start of ACHEMA, the model was delivered to the stand via badly damaged roads. Visitors can admire the impressive work and see how detailed it is there.

As a symbol of Pörner's bitumen expertise, it is not only a small masterpiece of engineering but also a testimony to the tireless determination and ingenuity of the group's employees. ■

Watch the making-of video to see how the model grows day by day.

BitumenBag™: More Flexibility In Bitumen Production

BITUMEN. Unipetrol overcomes seasonality with the Pörner Bitumen Packing System.

LITVINOV. ORLEN Unipetrol, the leading Czech producer of refinery, petrochemical, and agrochemical products, is implementing the Pörner Bitumen Packing System (PBPS) at its Litvinov refinery to extend bitumen production into the winter months and overcome seasonality.

The Pörner Cold Bitumen Logistics for storing cold bitumen makes this possible. Pörner was commissioned with the engineering services and the supply of a Cooling & Packing Unit (CPU) with a capacity of 20 tons per hour and an associated Bitumen Melting Unit. The project is scheduled to run from January 2024 to August 2025. It is the first cooperation with ORLEN Unipetrol after realizing a Biturox® production plant in 1997 and a Biturox® pilot plant in 2021 within the Orlen Group.

The Pörner Bitumen Cold Logistics

The PBPS, invented by Pörner and continuously developed since 2006, enables sustainable storage and ecological transport of bitumen for road construction in cold condition with a significantly reduced CO_2 balance. "One of the strengths of Pörner's cold bitumen logistics is the security of supply, especially in the event of sudden bottlenecks in road construction, which is always a project business," says Project Manager Christian Opitz. Unipetrol Project Manager Igor Meluš adds: "Thanks to the Pörner Bitumen Packing System, we can extend our bitumen production season and offer bitumen flexibly." ■

Bitumen can be stored long-term and transported cold in Pörner Bitumen Bags™ (filling station pictured on the right: here in Bahrain).

www.bitumenbag.com

Puraglobe Invests A High Double-Digit Million Sum

CIRCULAR ECONOMY. The world's largest site for used oil re-refining at Zeitz Chemical Park.

BY HOLGER LINKE

TRÖGLITZ. Puraglobe Deutschland GmbH has been operating several used oil re-refining plants at Zeitz Chemical Park. Puraglobe is the only manufacturer of API Group III & III+ base oils based on waste oil across the globe. Because of the high quality and the reduced CO_2 footprint, there is a high demand for these base oils on the market. Therefore, the customer invested a very high double-digit million euro amount to install a new plant, the third HyLube plant. It was completed in early 2024 and has since started operating as intended. Thus, this site is the largest of its kind in the world. EDL had already engineered the HyLube2 plant and later converted this plant by integrating an additional process stage.

> "During project implementation, around 200 equipment items, approx. 430 tons of piping/support material, approx. 50 kilometers of cable, approx. 1,200 measuring devices were installed as well as around 10,000 tons of concrete and approx. 1,000 tons of structural steel were used.
>
> Holger Linke
> Project Manager EDL

New challenges with HyLube3

The successful cooperation between the two companies continued in 2021 when EDL was awarded the contract for detail engineering and construction management by specialist engineers for the HyLube3 plant following preparatory work as part of an early work program.

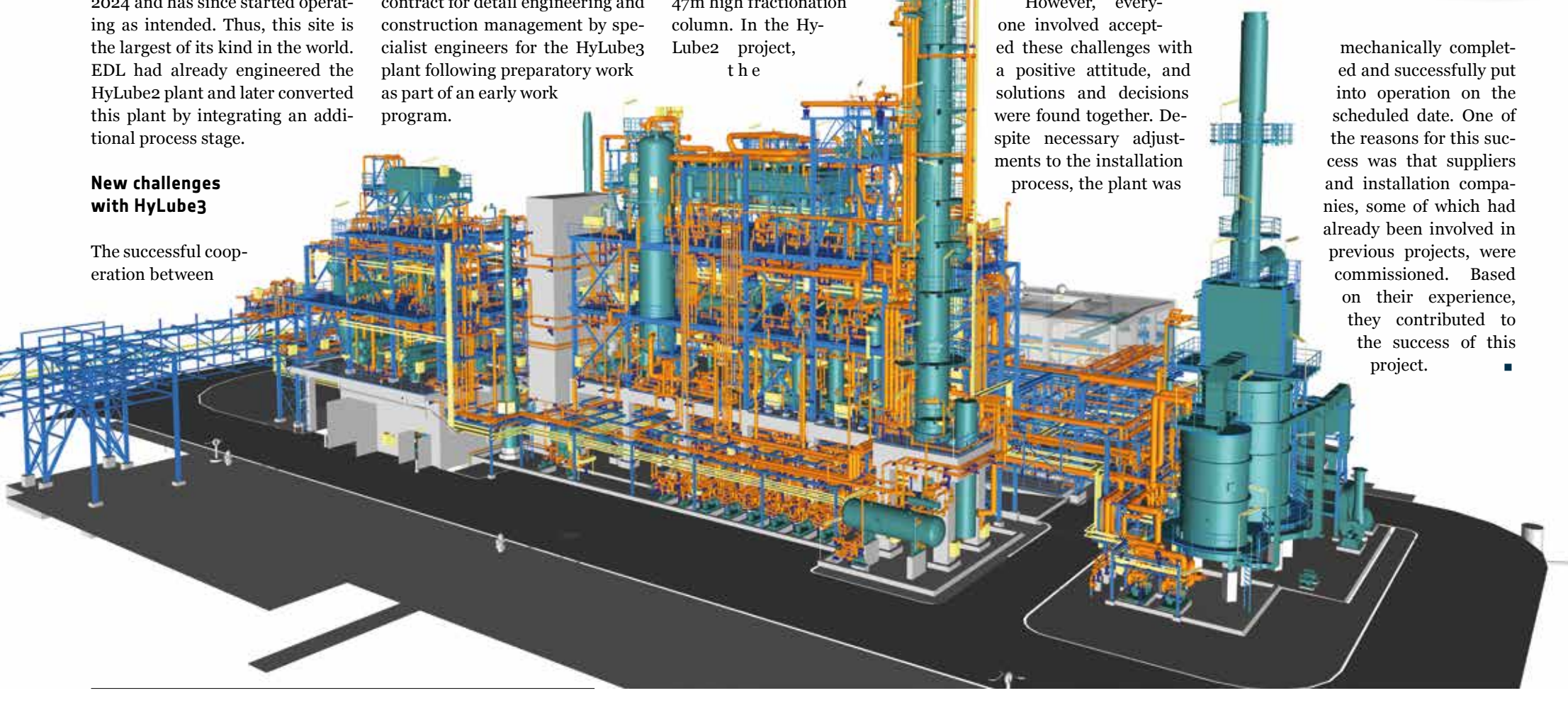
Compared to the previous projects, this time, there were new challenges for everyone involved in the project:

The first challenge was the execution structure: not EPC, but EPCm.

The second challenge was considerably more limited space for assembly. As a result, detailed planning and installation scheduling had to consider the limited pre-assembly options and delivery of equipment on the necessary assembly dates. Example: the 47m high fractionation column. In the HyLube2 project, the column was pre-assembled horizontally and then lifted into place. In the HyLube3 project, the column was installed first, and scaffolding was put up. Finally, the column was completed step-by-step with steel platforms, pipelines, etc.

Third challenge: Problems arose due to the change of the political situation in February 2022. Equipment manufacturers were explicitly affected by this situation in terms of material procurement.

However, everyone involved accepted these challenges with a positive attitude, and solutions and decisions were found together. Despite necessary adjustments to the installation process, the plant was mechanically completed and successfully put into operation on the scheduled date. One of the reasons for this success was that suppliers and installation companies, some of which had already been involved in previous projects, were commissioned. Based on their experience, they contributed to the success of this project. ■



PURAGLOBE
OUR CLIMATE. OUR PASSION

USED OIL RE-REFINING AT PURAGLOBE

Puraglobe processes used engine oil. The oil is treated in a complicated process and led through 16 catalysts at high pressure and temperatures. In this multi-stage process, all impurities are removed from the oil. Thus, used oil can be reprocessed several times - without losing quality. Puraglobe says this technology can save around 180,000 tons of CO_2 annually.

TAF PÖRNER GRUPPE

New Research Recycling Pilot Plant At Fraunhofer IKTS.

Fraunhofer IKTS

RECYCLING. TAF hands over pyrolysis plant for plastics recycling.

FREIBERG. TAF Thermische Apparate Freiberg GmbH (TAF), a company of the Pörner Group, received an order from the Fraunhofer Institute for Ceramic Technologies and Systems IKTS for a newly designed pilot plant for the pyrolysis of plastics. The pilot plant was successfully commissioned in July 2023. TAF was responsible for the planning, engineering, construction, delivery, commissioning, and documentation of the pyrolysis plant.

The Pyrolysis Process: From Waste to Resource

In the pyrolysis reactor, a wide variety of feedstocks and mixtures of plastics and residual materials are pyrolyzed at throughputs of up to 100 kg/h and max. 2.0 t/d at temperatures around 500 degrees. The resulting products, such as pyrolysis coke, pyrolysis gas, and condensates, must be sampled and safely disposed of per licensing regulations and technical requirements. In addition to residual materials, household plastic waste (e.g., the "yellow bag"), shredder light fraction from car disposal, composite materials, or even torrefied biomass can be thermally processed. With the pilot plant, the Fraunhofer IKTS is gaining essential knowledge for research and up-scaling to industrial scale.

TAF Managing Director Daniel Ullmann is pleased to be able to contribute to the sustainable use of plastics: "The research results will help to convert more residual materials into recyclable materials. For example, processing plastic waste from the oceans will be possible. It is great that, together with Fraunhofer IKTS, we have contributed to more sustainability in the use of plastics." ■

> "Pilot plant construction is our specialty!
>
> Daniel Ullmann
> Managing Director TAF

▲ ▶ **The new pilot plant of Fraunhofer IKTS.**

HyKero Project For PtL-SAF

SUSTAINABILITY. Johnson Matthey and bp support EDL.

LEIPZIG. To implement the HyKero project to produce electricity-based, sustainable aviation fuel, so-called PtL-SAF, EDL will apply the award-winning Fischer-Tropsch (FT) CANSTM technology. It was co-developed by Johnson Matthey (JM), a global leader in sustainable technologies, and bp, an international energy company.

The HyKero plant is planned to produce 50,000 metric tons PtL-SAF per year when fully operational based on the patented HyKero process developed by EDL and would therefore cover 25 percent of the SAF quota and 50 percent of the e-SAF subquota required in Germany in 2028. Based on a typical widebody aircraft fuel consumption the planned production capacity (after blending) is equivalent to the fuel required for over 1,000 transatlantic flights annually.

An important contribution to defossilization

Dr. Michael Haid, CEO at EDL, is delighted: „We are proud to use the FT CANS technology in our HyKero plant to produce PtL-SAF, thus making an important contribution to the defossilization of the aviation sector in Germany. The FT CANS technology enhances the value of our HyKero plant for converting sustainable carbon sources like bio-methane, together with renewable power and carbon dioxide into PtL-SAF. We look forward to working with Johnson Matthey and bp as we build out the HyKero plant portfolio in Germany and abroad."

Representatives of Johnson Matthey and bp are also optimistic. Alberto Giovanzana, Managing Director, CT Licensing at Johnson Matthey, said: „At JM we are committed to helping our customers decarbonise. We are therefore very excited that EDL has chosen our FT CANS technology, developed in collaboration with bp, to supply airlines with sustainable aviation fuel that can be used in their existing fleets. Projects like this are very important to increase the production of SAF as the industry works to achieve its net zero ambitions."

And Noemie Turner, VP Technology development & commercialization at bp, added: „We are delighted that EDL has joined a growing number of businesses choosing our innovative FT CANS technology, developed through world-class research and development in partnership with Johnson Matthey, to enable commercial scale production of sustainable aviation fuels at EDL's HyKero plant." ■

The HyKero plant is part of the lighthouse project LHyVE for a regional and supra-regional sector coupling of industry, traffic and supply using green hydrogen.

Smallest Molecule With The Greatest Potential

HYDROGEN. Both an opportunity and a challenge for the energy transition.

BY DR. MICHAEL HAID

Reducing greenhouse gas emissions across all sectors of the economy is one of the global challenges of the coming years. Hydrogen is an indispensable resource for the transformation of industry. With sustainably produced hydrogen, industrial processes can be made climate-neutral.

Intersectoral applications

EDL plays an active part in defossilization and, together with partners from the Leipzig region, has launched the joint LHyVE (Leipzig Hydrogen Value chain for Europe) project. The aim is to build an intelligent and regionally cross-linked green hydrogen system as a lighthouse project for efficient sector coupling on an industrial scale and an example for the use of renewable energy. It will be integrated into the emerging European hydrogen infrastructure in the future. The greatest opportunities for hydrogen are where cross-sector use of hydrogen is possible and generation, consumption, transport, and storage can be intelligently linked.

IMAGE: SHAWN HEMPEL, ADOBE STOCK

Part of the joint project is the HyKero plant of EDL and its subsidiary XFuels GmbH. The plant will produce green hydrogen and use it with carbon from approved sources for the industrial production of sustainable products. From 2028 onwards, the plant is to produce 50,000 tons of sustainable aviation fuel, so-called PtL-SAF, per year on an industrial scale for the aviation industry at the site in Böhlen-Lippendorf, south of Leipzig.

Clear framework conditions for the use of hydrogen

When producing PtL-SAF, the efficient use of hydrogen generated by electrolysis is an essential key to the success of the energy transition. Currently, however, there is a shortage of the required large quantities of climate-friendly hydrogen and renewable electricity.

To meet the great demand, clear and internationally competitive framework conditions are necessary that provide sufficient long-term security, but also create incentives for investments. ■

Mark Hartmann
Process/Technology Engineer

INNOVATIVE PARTNERSHIPS

EDL supports research into green ammonia and CO_2-neutral marine fuel

LEIPZIG. The efficient use of new, biogenic, and sustainable feedstocks to produce marine fuels has mostly been demonstrated on a small scale only. Due to limited experience in upscaling and commercializing such projects, experienced plant engineering companies and system integrators with expertise in risk management are sought-after partners. This is why EDL is involved in developing new technologies right from an early stage. Thus, new and efficient process steps are prepared for application on an industrial scale well in advance, and property rights are secured in good time.

With this motivation, EDL is involved in two state-funded joint research projects and cooperates with well-known national and international research institutes. Both projects foster the development of innovative process steps to produce CO_2-neutral marine fuels towards larger, industrially relevant production capacities.

This research cooperation aims to create novel technical concepts that can be implemented within a narrow time frame to produce green ammonia and a biogenic blending component for marine diesel oil (MDO) or the HFO pool (heavy fuel oil). It includes a cost calculation for the construction of industrial-scale production facilities.

New River Water Treatment Plant At Höchst Industrial Park.

ENVIRONMENT. Overall planning of the treatment plant for the highest water quality.

IMAGE: INFRASERV HÖCHST

The new river water plant supplies the industrial park with 15,000 cubic meters of water per hour.

BY ANDREAS TROSTMANN

FRANKFURT/M. Infraserv GmbH & Co., Höchst KG at Industriepark Höchst in Frankfurt, am Main, Germany, has built a new river water plant to supply the 460-hectare industrial park with high-quality water. Every year, 60 million cubic meters of water from the Main River are extracted and purified. In this manner, the water can be reused up to 50 times.

Infraserv awarded the team of the "Pörner Water" competence center in Vienna with the engineering, supply, installation, and commissioning of a river water treatment plant.

Membrane technology for efficient water treatment and water protection

With the new river water treatment plant engineered by Pörner Water, technologies of fine and ultrafiltration, chemical flocculation, and chemical cleaning of membranes are used with a purification capacity of up to 1,100 cubic meters per hour.

River water is treated to produce water free of solids and germs by converting the existing pure water plant to the ultrafiltration process. The ultrafiltration membranes provide a safe physical barrier to particulate contaminants and microorganisms in the raw water.

"Pörner Water" Project Manager Andreas Trostmann on the increasing importance of the technology in industrial plant construction: "Membrane technology is not only an excellent method for efficient process water treatment, it also contributes to water protection due to the highly reduced demand for chemicals. We look forward to building further water treatment plants with this technology." ■

PÖRNER WATER

With the "Pörner Water" competence center, the plant engineering company is expanding its services to include industrial water treatment. It is using its comprehensive expertise to minimize energy and water consumption as well as plant emissions in a sustainable manner.

ILLUSTRATION: JL-ART | ADOBE STOCK

infraserv höchst

Advanced Groundwater Treatment

WATER. Best practices and innovative solutions.

BY DR. ROBERT VRANITZKY

Water is critical in industrial processes for cooling, steam generation, cleaning, or as a solvent. Highly specialized processes require customized treatment methods to meet quality requirements and conserve resources. Remediating contaminated groundwater is a particular problem in the oil and gas industry.

Contamination by BTEX compounds, which include the volatile aromatic hydrocarbons benzene, toluene, ethylbenzene, and xylene, is widespread and requires specific treatment measures. At petroleum processing sites (see diagram), BTEX and other contaminants can migrate to the underlying aquifers due to accidents or leaks. Appropriate methods must be identified to remove these contaminants effectively, making this water source available for internal use, and mitigate potential water supply shortages.

Treatment options for contaminated groundwater

One option is **biologically activated fixed bed filtration**, which uses microorganisms to break down organic contaminants. This process achieves high degradation rates, but there is a risk that the microorganisms will be transferred to downstream processes.

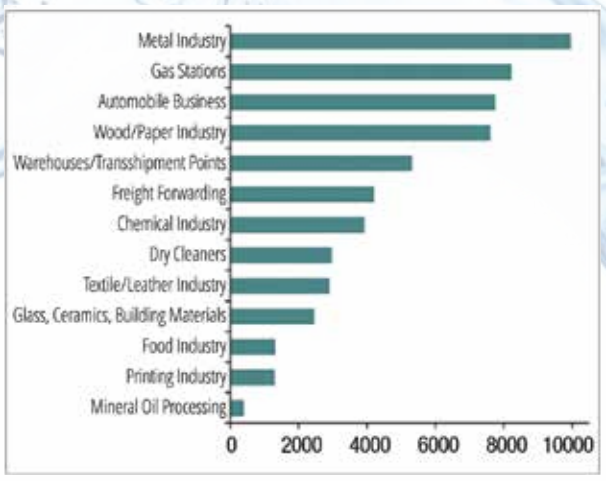
Alternatively, **oxidative processes** such as chemical or electrochemical oxidation use strong oxidants to break down contaminants. However, unwanted by-products may be produced. Oxidative processes are in addition expensive and require specialized equipment.

Physical processes such as stripping effectively remove volatile hydrocarbon contaminants from water. In this process, the liquid phase is treated with gas using the countercurrent principle to remove the contaminants from the water by desorption. Efficiency depends on the gas-liquid ratio, determined by the Henry constant of each substance. Exhaust air treatment is often required to remove the organic water constituents, which can be done by adsorption, cooling, or decomposition. This process has been used for years to remove BTEX compounds from groundwater.

Conclusion

The selection of the optimal treatment process depends on the specific requirements and objectives of the remediation project. The experts of Pörner Water support industrial clients with tailor-made concepts for optimizing existing water treatment processes and implementing new projects. ■

Reference: Federal Environvoment Agency (2024).



Number of contaminated sites by sector.

IMAGE: PINEAPPLE STUDIO | ADOBE STOCK

Pörner Automates Large-scale Box Plant In The USA

RECYCLING. Construction of $700m plant.

HENDERSON. The US company Pratt Industries, Inc. officially commissioned its $700 million 100% recycled paper mill and corrugated box factory in Henderson, Kentucky.

Pörner Ingenieurgesellschaft in Vienna supported this major project with the electrical, instrumentation, and control engineering for the two core units, stock preparation, and paper mill. The new 107,000 m² plant now produces 1,500 tons of recycled paper daily, which is further processed into corrugated cardboard and boxes.

According to Pratt, the mill saves the equivalent of 25,000 trees daily and is the world's most environmentally friendly paper mill. The mill officially opened in September 2023.

Just like the conversion of the paper mill in Ohio/USA in 2018, the planning was carried out hand in hand with Carantec from Klagenfurt/Austria, which managed the overall project and was responsible for the 3D planning and piping, and with the German company Eurocon, which specializes in process engineering in the paper recycling sector. ■

For more environmental protection and sustainability, Pratt invests $700m in a 100% recycled paper plant.

IMAGE: PRATT INDUSTRIES

Drum Drying Plant For Bio-based Starches

GREEN GLUES. AGRANA commissions Pörner with the overall planning of the multi-million euro project.

GMÜND. The fruit, starch, and sugar Group AGRANA is building an additional drum drying plant at its potato starch mill in Gmünd, Austria. With an investment of 23 million euro, AGRANA wants to increase the production of technical starches for the construction and adhesive industries by one-third. Pörner Vienna is responsible for basic and detail engineering, construction supervision, project management, and commissioning support. The new industrial plant is expected to be completed in July 2025.

Pörner Project Manager Manfred Paulus explains the challenges: "A new production building is being erected for the drum drying plant from raw material input to drying the finished product. For this, we have to execute the installations and tie-ins so that the ongoing operations will not be interrupted. Moreover, only limited space is available for the construction and installation activities."

Pörner has already implemented several projects for AGRANA, such as a betaine plant, a plant for producing baby food and the largest bioethanol plant in Austria.

Bio-based feedstock for sustainable products

The current project supports the industry in decarbonizing by creating bio-based materials such as starch as a sustainable alternative to petroleum-based products. Dr. Norbert Harringer, CTO of AGRANA BeteiligungsAG, emphasizes that expanding the Gmünd plant will enable the company to meet rising demand and secure its competitiveness.

AGRANA starch is used in the construction chemicals industry to improve the consistency of building materials and in the adhesives industry as an alternative to synthetic adhesives, also known as "green glues." ■

> "The installation and tie-ins will be done without interrupting current operations.
>
> Manfred Paulus
> Project Manager Pörner

PHOTO: APA/SCHEDL _ AGRANA

The starch plant in Gmünd will be expanded for 23 million euros.

PHOTO: APA/SCHEDL _ AGRANA

Turnkey Bangladesh

REVAMP. Fertilizer plants for AFCCL.

ASHUGANJ. Bangladesh is a country that depends strongly on agriculture. About 70% of the land is used for agriculture, and about 40% of the population is employed in the agricultural sector. Fertilizer production is, therefore, vital. In recent years, Pörner's Advanced Energies department has modernized one of Bangladesh's six existing fertilizer factories.

The customer Ashuganj Fertilizer & Chemical Company Limited (AFCCL) awarded Pörner, beginning in 2021, with different revamp projects like the modernization of the CO_2 cooler, the BFW (boiler feedwater preheater) as well as the start-up heater. The lump sum turnkey contracts included detail engineering, procurement, on-site supply, project management, site supervision, and commissioning.

After being listed as a trusted supplier in Bangladesh and successfully completing these projects, Pörner and its Project Manager, Christian Geyrhofer, look forward to continuing this fruitful partnership. ■

DB & EDL On Track(s)

INFRASTRUCTURE. Partnership for a modern rail infrastructure.

COLOGNE. DB InfraGO AG, a subsidiary of Deutsche Bahn AG, is continuing its modernization measures in rail transport with a series of significant investments. As part of this, EDL collaborates with DB InfraGO AG and Geschw. Balter Bauunternehmung GmbH to further develop the rail infrastructure in Germany.

Reconstruction of 77 bridges

Under the project name "ESTW Duisburg", DB InfraGO AG is investing a double-digit million amount in the modernization of electronic signal towers and in extensive reconstruction measures on 77 bridge structures in the Ruhr district. EDL undertakes detail planning as part of the object and structural engineering for the respective bridge structures and cable routing systems. The work is expected to be completed until 2024/2025. The project thus significantly contributes to the modernization and enhancement of safety and performance of the rail infrastructure in the Ruhr district.

Expansion at Cologne Central Station

At the same time, as part of the "ESTW Cologne" project, the Cologne railway hub is being expanded and a new electronic signal tower is being built in the Cologne Central Station area. EDL is strongly involved in the planning of this key project. Its responsibilities include object and structural engineering. EDL is not only in charge of planning the individual rail transport facilities, but also of constructional consulting. The investment for the entire electronic signal tower project around Cologne amounts to a three-digit million amount, which underlines Deutsche Bahn AG's commitment to modernizing the rail infrastructure. The work is expected to be completed until 2025/2026. This project marks the start of a new, forward-looking era for the Cologne railway hub and the region. Deutsche Bahn AG is strongly committed to modernizing the rail infrastructure to meet the increasing demands for capacity and efficiency. "We at EDL are proud to be able to support Deutsche Bahn AG on this path and to make a contribution to the design of a future-proof rail infrastructure," says Dominik Drazewski, Head of Civil and Structural Steel Department at EDL. ■

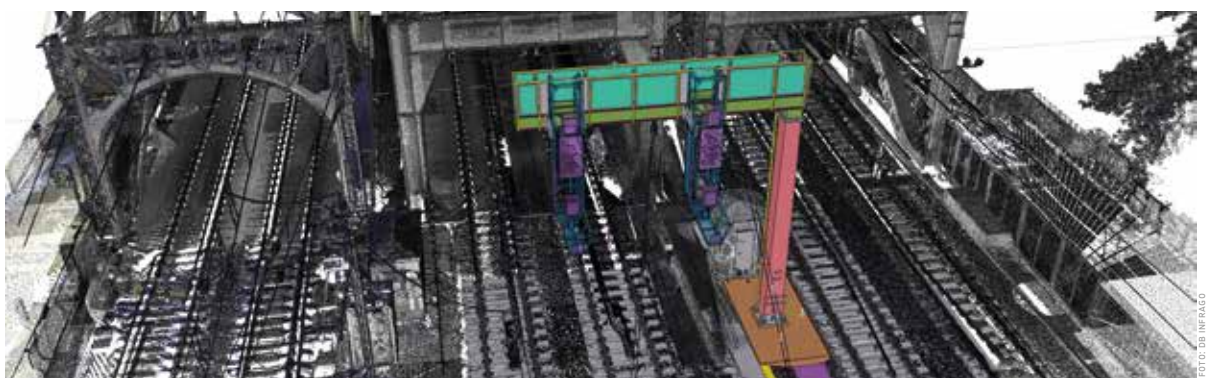


FOTO: DB INFRAGO

Investments in a three-digit million amount at the Cologne railway hub: the Hohenzollern Bridge in Cologne.

FOTO: DB INFRAGO

Can't Do It? No Such Thing!

ENGINEERING & MANUFACTURING. TAF focuses on customized solutions in plant engineering.

FREIBERG. Since joining the Pörner Group in 2011, TAF Thermische Apparate Freiberg GmbH has become a key developer and provider of specialized mechanical and plant engineering solutions, particularly for processes requiring higher temperatures and pressures. Emphasizing sustainability, TAF specializes in custom development and manufacturing pilot and research plants.

The company's 1,900 sqm manufacturing hall allows equipment weighing up to twelve tons to be produced. TAF excels in delivering innovative technological solutions tailored to specific needs and in developing custom constructions for established and new processes. When the Pörner Group companies need specialized components for process plants quickly and reliably, they rely on TAF's expertise. ■

New Management

DANIEL ULLMANN
Thorough. Reliable. Organized.

Daniel Ullmann, who has been with TAF since 2012, began his career as a design and project engineer before being appointed Head of Engineering and authorized signatory in 2013.

Since June 2023, he has been serving as Managing Director of TAF, overseeing Engineering, Marketing, Sales, and IT. He also ensures a smooth generational transition and the continuous development of staff qualifications.

Daniel Ullmann is a certified welding engineer and studied mechanical engineering and design at HTW Dresden. Before joining TAF, he gained valuable experience in plant planning, including the material utilization of renewable raw materials. When asked about future challenges, Daniel Ullmann quoted Aristotle: "We cannot change the wind, but we can adjust the sails. New technological developments during the energy transition are great opportunities for us and our customers."

> "New technological developments during the energy transition are great opportunities for us and our customers.

UWE MÜTTERLEIN
Pragmatic. Fair. Optimistic.

Uwe Mütterlein has a long history with TAF, having worked there from 2003 to 2007 before gaining international experience. He began his career with a degree in mechanical engineering from TU Dresden and spent a year abroad at the University of Central Lancashire in England. After various positions both domestically and internationally, including a role as a research associate at TU Dresden in Hanoi, Vietnam, he returned to TAF in 2021.

Since his return, he has led the manufacturing department and was appointed Managing Director in June 2023. Uwe Mütterlein is now responsible for Production and Assembly Planning, Human Resources Management, Quality Assurance, Maintenance, and Procurement. He is committed to supporting employees in the daily production flow and creating a positive working environment. His goal is for TAF's quality and products to delight and convince customers, ensuring repeat business.

> "TAF's quality and products must excite our customers!

Duels and thrills: Team Pörner is outstanding at work and on the soccer field! After an exciting penalty shoot-out, our guys brought home a well-deserved victory. They won the annual friendly tournament with well-known company teams from the industry in October 2023. We are proud of our team and congratulate them for this great success!

ILLUSTRATION: WETZKAZ | ADOBE STOCK

Sports For A Good Cause

CSR. Pörner engineers run for microcredits for small businesses.

Our employees have done it again: in 2023, they participated in several running events and ran a total of 574.14 kilometers. That means, the employees doubled their performance compared to the previous year! And because Pörner cares about the health of its employees and wants to encourage participation in running events, Pörner covers all entry fees.

Five euros per kilometer

Additionally, five euros will be donated to Oikocredit International for every kilometer run this year. The money is not just a donation, but a social impact investment for people at the bottom of the social pyramid. Oikocredit distributes the invested money via local microfinance partners to people primarily in the Global South. Pörner will donate the resulting annual dividends to support small(est) enterprises, enabling people to build self-determined lives.

This initiative makes Pörner part of a movement for a fairer world that aligns with the Sustainable Development Goals of the United Nations. The employees of all ten locations of the Pörner Group are already looking forward to the next challenge when it is again time for **#PörnerInMotion**!

If you would also like to support Oikocredit International, read more about it here.

OIKO CREDIT in Menschen investieren

Lectures At Austria's Technical Colleges

Pörner inspires future engineers.

VIENNA. Pörner is committed to igniting a passion for engineering among young minds. CEO Andreas Pörner has launched a new initiative at Austria's higher technical colleges ("Höhere Technische Lehranstalt"; HTLs). He delivers practical lectures on (large-scale) plant construction, offering students their first glimpse into the engineering profession.

One notable example was Pörner's contribution to the "Day of Mechanical Engineering" at HTL Mödling, where he informed enthusiastic young technicians about the Pörner Group's projects and the specific career opportunities within the company. These activities also received attention in the regional press.

Furthermore, workshops with extensive discussions on project management in plant construction were held in fall in Mödling and as a "Christmas Lecture" at TGM in Vienna, attracting significant interest from prospective graduates. Pörner practically illustrated project management and organization interaction with cost estimation, contracting, and scheduling with the technical departments in the company's matrix organization with a completed bitumen plant as a case study. ■

Managing Director Andreas Pörner is lecturing aspiring engineers at a Higher Technical College.

The Pörner Spirit

BY MARIE LOPATKA

The success of five decades of the company's history extends beyond technical expertise. The Pörner spirit has guided, inspired, and connected employees for more than 50 years, transforming individual projects into masterpieces of engineering. At Pörner, passion for plant engineering is paramount. Both younger and older generations work together, valuing knowledge and driving progress. Professional development is not only encouraged but individual personalities are also strengthened. It is the uniqueness of people that fuels progress. Flat hierarchies, open communication, and respectful collaboration create an environment where creativity and innovation thrive.

▲ **One of the Highlights: Annual Christmas Party.**
▼ **Once a year, our team embarks on an exciting excursion lasting several days, exploring destinations both within Austria and abroad.**

Our power, our passion, our spirit @Pörner.

Practical and solution-oriented

At Pörner, we guarantee variety in our activities because our employees are not just theorists—they are doers. Whether it's a new plant, an initial plant, or a revamp, we physically bring the work to life, ensuring it serves its purpose for years. Individual ideas and suggestions make a significant difference, continually enhancing our strengths and driving our development.

A career with promising prospects

At Pörner, we offer more than just a job—we provide an outlook and a solid foundation for a professional journey. The company prioritizes continuous investment in the training and development of its employees, ensuring they are well-equipped to tackle future challenges. From company celebrations to team outings and regular sporting events, fostering team spirit and mutual support is ingrained in the Pörner philosophy. After all, the synergy of teamwork fuels creativity and innovation. ■

Experience the Pörner Spirit!
www.poerner.at/en/careers/

Five *Exceptional* Engineers Can Transform The World

In an interview with Managing Director Andreas Pörner, we delve into the pivotal role dedicated engineers play in modern plant engineering and their contribution to a sustainable future:

What opportunities are available for young engineers in plant engineering?

AP: Plant engineering presents a myriad of development opportunities for aspiring engineers. The hands-on training at Pörner enables graduates to swiftly immerse themselves in project work and pursue careers in project management or technical specializations. Our experience indicates that after completing one or two projects, our recruits are well-prepared for more advanced responsibilities.

How can engineers in large-scale plant engineering ensure their work contributes to positive change?

AP: The ongoing climate discussions have a strong and positive impact on plant engineering. For years, our company has been at the forefront of the "green shift," actively engaged in forward-looking areas such as PtX and BtX, synthesis gas, and hydrogen. Sustainability and environmental compatibility are top priorities in the planning and execution of all our projects. In today's engineering landscape, it's imperative to prioritize not only efficiency and cost-effectiveness but also the preservation of natural resources and the minimization of adverse environmental impacts.

What message would you like to convey to newcomers?

AP: In our increasingly interconnected world, there's a demand for both broad-minded generalists and specialized experts who can significantly contribute to shaping a better future. Large-scale process plant engineering offers diverse opportunities to devise innovative solutions for some of the most pressing global challenges. This endeavor requires dedication, creativity, and collaborative effort. The chance to make a real difference is invaluable, and benefits our clients, society, and the environment. I can attest from personal experience that, with the right conditions, five exceptional engineers can change the world! ■

IMAGE: SOLVR | DALL·E (AI)

Modernization For Progress and Efficiency

Pörner Romania shines in new splendor.

PLOIESTI. The Pörner location in Ploiesti, Romania, has undergone a significant transformation, both inside and out, at the beginning of the year. This comprehensive renovation aimed to create a modern, functional, and visually appealing workplace for employees and customers alike.

In addition to the aesthetic improvements, the location's software and server infrastructure have been upgraded, ensuring that technical specialists have access to the latest tools necessary for designing future plants. Work areas have been modernized inside the building, and new co-working spaces have been created to allow teams to collaborate efficiently, share ideas, and be creative together. This investment in the Ploiesti location highlights Pörner's commitment to the region and its future growth, reinforcing its dedication to progress and innovation. The modernized Ploiesti office is a testament to Pörner's vision for a bright and efficient future. ■

The office in Ploiesti was modernized inside and out.

ILLUSTRATION: TASHATUVANGO | ADOBE STOCK

ILLUSTRATION: VLADAN | ADOBE STOCK | KI

SAFETY FIRST!

PLANT SAFETY FOR PEOPLE AND THE ENVIRONMENT

BY ANDREAS PÖRNER

It's a nightmare scenario: a toxic, flammable liquid leaks in a chemical plant, ignites, and causes an explosion, resulting in human casualties and significant property damage. Such disasters are rare in our regions thanks to strict regulations and continuous monitoring. However, plants in the process industry are highly complex systems. They handle sensitive materials at high temperatures and pressures, increasing the risk of significant incidents. The perpetual credo "Safety First" is essential to prevent accidents and avoid environmental damage.

Safety as a top priority

Major technological disasters in history, such as the Titanic, Seveso, Bhopal, or Chornobyl, highlight two primary risks: (often hidden) technical flaws and human error. Thus, plant engineers are heavily responsible for planning and implementing plants safely. The goal of "Zero Accidents" is firmly embedded in every project. Achieving this goal requires proactive safety management, thorough analyses, and meticulous, forward-looking planning executed consistently and reliably by experienced teams.

Workplace and plant safety are the highest priorities in a plant engineering company like the Pörner Group. All designed plants aim to be among the safest of their kind, with all construction and assembly activities conducted under maximum safety conditions.

QHSE policy as an integral part of corporate policy

The QHSE policy, certified to DIN EN ISO 9001 and aligned with ISO 45001, is rigorously implemented in the Pörner Group's QHSE management. All company levels are involved, from management to all office and construction site planning stages. Regular training on handling hazardous materials, emergency measures, and periodic safety procedure reviews are part of implementing a safety culture. Safety-relevant aspects from all disciplines are integrated into the planning from the start.

When addressing process and safety engineering in a project, the following points are essential:

1. **HAZOP Studies** These identify potential hazards, operational disruptions, and deviations from normal operating conditions and their impacts. Risk minimization measures include additional safety-oriented shutdowns and safety valves.
2. **Safety Integrity Level (SIL) Classification:** All safety-critical components and systems are evaluated and classified into required levels according to international standards like IEC 61508 and IEC 61511.
3. **Flare Studies:** These examine flare and safety systems and assess safety aspects for normal plant operations, deviations, and emergencies, deriving operational safety measures that help avoid environmental impacts.
4. **Safeguarding Memorandum:** A centrally managed document detailing all safety measures and systems, including safety functions, alarms, protective devices, and corresponding responsibilities.
5. **IPF Workshops (Interdisciplinary Process Flow Workshops):** Experts analyze process flows to identify potential safety hazards and prevent accidents.

Safety on Pörner Group Construction Sites is a Top Management Priority! In February 2023, Ralf Seid (right), Refinery Manager of Gunvor Raffineriegesellschaft Ingolstadt GmbH, and Daniel Oryan (left), Managing Director of EDL, personally verified the compliance with the HSSE management system on the construction site during a Safety Walk Audit.

Design Reviews ensure Plant Reliability and Process Safety

These ensure plant reliability and process safety. The plant model is reviewed at milestones (30/60/90% planning progress) with all involved disciplines in model reviews. Virtual walkthroughs examine safety aspects such as human factors engineering, escape routes, accessibility, and safe operation of fittings. Safety-related deviations are identified, corrected, and improvement potentials are implemented at each stage.

Workplace safety during project implementation

In the construction phase, workplace safety is crucial. Pörner conducts safety assessments of contractors for construction and assembly, with contractor selection based on proven experience and adherence to high safety standards. Regular briefings on occupational health, safety, and environmental protection raise safety awareness among all companies involved on-site and promote knowledge exchange.

Conclusion

Comprehensive safety in planning, construction, and operation requires many detailed steps and a holistic approach. It is essential to foster safety awareness and professional discipline among all participants to identify and minimize potential hazards to people, machinery, and the environment. ■

Above-Average R&D Investment For A Sustainable Future

IN-HOUSE UPDATE. Pörner invests 3% of turnover in Research and Development.

BY PETER SCHLOSSNIKEL

PHOTO: PHILLIP SIMONS

The Pörner Group is sending a strong signal in terms of climate change with an R&D investment ratio of three percent, which is well above the OECD industry average. According to KfW (2024), 83 percent of mid-sized companies invest only about one percent. This underscores the Pörner Group's commitment to sustainability and progress.

R&D in technologies

Our investments focus on advancing proprietary technologies, such as Biturox® for bitumen production and SDA for efficient refinery residue processing. Additionally, we are developing processes in renewable energies and valuable materials, including Pörner Bio-Silicates from rice hull ash and EDL's HyKero technology to produce electricity-based sustainable aviation fuel (PtL-SAF).

Inspired by Benjamin Franklin's quote, "An investment in knowledge pays the best interest," the company

- operates five pilot plants (Biturox® pilot plant in Schwechat, Bio-Silicate demonstration plant in Freiberg, SDA-Plus/extraction pilot plant, dewaxing/deoiling pilot plant, and LEPD test facility in Leipzig) and
- employs over 50 process engineers.

The Pörner Group advances its technologies at five pilot plants. Image: SDA pilot plant of EDL.

Through pilot test results and process simulations, we guarantee our customers that a user-oriented upscaling to an industrial scale can be conducted reliably. Moreover, our subsidiary TAF has been specializing in designing and manufacturing pilot and initial plants for many years. A feature, which perfectly complements our R&D orientation.

Digitalization in plant engineering

We are also pushing digitalization of plant engineering to increase efficiency and sustainability right from the planning stage. One result is our proprietary "Pörner Integration," which significantly optimizes our execution processes (see article on page 3).

Conclusion

It is crucial to engage in research and development for a better future. The Pörner Group is proud to make a substantial contribution to this end and looks forward to not only developing innovative solutions for tomorrow's world but also implementing them. ■

Reference: KfW Bankengruppe. (2024). KfW-Innovationsbericht Mittelstand 2023.

ILLUSTRATION: ALEX | ADOBE STOCK