

Hendrik Wüst Visits ZINQ at Klimahafen Gelsenkirchen

North Rhine-Westphalia's Minister President Learns About Real-World Transformation Projects from the Industrial Sector at the Energy and Resource Transition Real-World Laboratory

GELSENKIRCHEN. Making energy-intensive industries climate-neutral while safeguarding industrial value creation: How companies are driving this transformation was the focus of North Rhine-Westphalia Minister President Hendrik Wüst's visit to ZINQ at the Klimahafen in Gelsenkirchen. As a real-world laboratory for the energy and resource transition, the Klimahafen combines the decarbonization of industrial process heat with circular value creation. More than 15 industrial and commercial enterprises have joined forces in the city harbor as part of an initiative supported by the city, the Chamber of Industry and Commerce (IHK), and the Science Park. As a process heat cluster, the Klimahafen serves as a prototype for energy-intensive industrial small and medium-sized enterprises (SMEs): The companies require approximately 600 GWh of energy per year—about 75 percent of the total energy consumption of all Gelsenkirchen residents. Under real-world industrial conditions, solutions are being developed here that are intended to be transferable to other companies and industrial sites. "Small and medium-sized industrial enterprises are the drivers of transformation. At Klimahafen, companies are putting the energy and resource transition into industrial practice while also demonstrating what it takes to scale these approaches," says Lars Baumgürtel, spokesperson for Klimahafen Gelsenkirchen and CEO of the ZINQ Group.

During a tour of ZINQ's production facilities, Minister President Wüst gained firsthand insight into the energy-intensive processes at the Gelsenkirchen site: More than 600 metric tons of zinc are kept molten around the clock at approximately 450 °C. The heat required for this is still generated using natural gas. The goal is to gradually replace natural gas with low-carbon energy sources.

A key approach to this at the Klimahafen is Smart Power-to-Heat (SP2H): Industrial process heat is to be generated flexibly using various energy sources. To achieve this, electricity, gas, and—in the future—hydrogen are intelligently coupled (energy source coupling). When a large amount of renewable electricity is available, it is used for heat generation and stored thermally. In the event of an electricity shortage, the system switches to gas and, in the future, hydrogen—without interrupting production. In this way, by providing industrial flexibility, the process heat serves the highly volatile electricity market. Two studies funded by the German Federal Environmental Foundation

(DBU) have examined and confirmed the potential of this approach: According to the studies, hybrid systems combining electricity and molecular energy carriers are a key component in the decarbonization of industrial process heat. The majority of companies in the "Climate Port" would

prefer to switch from natural gas to hydrogen as an energy carrier for various reasons, provided it is available and affordable.

A recent study building on this research demonstrates the added value of industrial process heat for the energy system: With SP2H, surplus renewable electricity can be used directly in industrial value creation; this eliminates the need for a large portion of the extremely expensive and resource-intensive battery storage systems and results in significantly greater system flexibility. The usable capacity of existing industrial facilities that can be converted to SP2H is equivalent to more than €100 billion in new investments in battery storage.

Using Hydrogen for Industrial Applications

To facilitate the gradual replacement of natural gas, Klimahafen is preparing to use hydrogen for industrial process heat. The first steps have already been taken: Hydrogen-rich energy gas from a nearby coking plant is already being used at Klimahafen, for example at TRIMET for aluminum recycling and at Arsol for chemical processing. ZINQ also has plant technology capable of handling energy gas with a hydrogen content of up to 60 percent.

At the same time, further applications and the necessary infrastructure are being prepared. In the H2Raum project, ZINQ, ProPuls, and the Westphalian University of Applied Sciences are testing the use of hydrogen in surface engineering. In October 2025, VoltH2 received approval for a 20-MW electrolysis plant funded by the state of North Rhine-Westphalia as part of the HyPerformer program. Starting in 2029, the H2 Solution Lab is set to provide a research, testing, and demonstration infrastructure for hydrogen technologies, particularly for SMEs. Baumgürtel, who serves not only as spokesperson for Klimahafen but also as president of the North Westphalia Chamber of Commerce and Industry (IHK), emphasizes the significance of the initiative beyond the local area: “Especially for energy-intensive small and medium-sized enterprises, we need solutions that combine climate neutrality with competitiveness. Process heat offers great potential in this regard: It can flexibly utilize renewable energy while simultaneously reducing the strain on the energy system. This is relevant far beyond the Klimahafen.”

Resource Transition: Making Circularity Measurable

In addition to the energy transition, the resource transition is the second key area of focus for Klimahafen. In line with the triple-zero principle—zero emissions, zero waste, and zero

pollution—the focus is not only on climate-neutral processes but also on products of circular quality. For these products to gain a foothold in the market, circular quality must first

be measurable and comparable. As a subproject of the Prosperkolleg, ZINQ has developed an initial prototype for a Digital Circular Product Passport (DCPP) for metallic surfaces and steel products, which is now being applied to specific value chains.

The next step is the monetization of circular quality. As part of IN4climate.NRW, approaches for circular lead markets were developed in collaboration with the Wuppertal Institute, in which avoided environmental costs and resource use are assigned an economic value and are to be incorporated into procurement, contracting, and investment decisions. Building on this, a recent

study by the Wuppertal Institute examines specific instruments for a prototype circular flagship market using surface technology as an example. “For industry, the circular economy has long been a matter of securing raw materials and maintaining competitiveness. At Klimahafen, companies are leading the way with concrete solutions. However, it is crucial that products meeting circular quality standards can ultimately hold their own in the market and that avoided environmental costs are credited toward circular products.” says Baumgürtel.

From a Regional Real-World Laboratory to an NRW-Wide Network of Excellence

Through CirPEL (Circular Performer Emscher-Lippe), the circular economy in the region is being actively advanced in collaboration with companies and universities. Expert groups are developing action plans and flagship projects for the circular transformation. Circular Performer builds on this: Based at the Klimahafen, a business-driven network of excellence for the circular economy in North Rhine-Westphalia is taking shape, where pioneering companies will pool their expertise, develop scalable solutions, and engage other businesses. In this way, the Klimahafen is continuing its exemplary approach to the resource transition: developing and testing solutions rooted in industrial practice and scaling them up beyond the local area.

At the end, Minister President Wüst summed up: “North Rhine-Westphalia is an industrial state—and that’s how it should remain in the future. Climate protection and a strong industrial sector are not mutually exclusive. What’s crucial is that we succeed in putting innovations into practical use and providing our companies with the conditions they need to produce in a climate-neutral yet competitive manner. The Klimahafen demonstrates how this can work: Companies are collaborating on new solutions for energy supply and the use of process heat, turning technological progress into industrial reality. These are exactly the kinds of projects we need to ensure that good industrial jobs, value creation, and prosperity remain here in our state.”

Klimahafen Gelsenkirchen

The Gelsenkirchen Climate Port brings together more than 15 companies from a wide range of industries that have joined forces with the goal of transforming the Gelsenkirchen City Harbor into a climate-neutral industrial and logistics hub. Six of these companies use process heat generated from natural gas at various temperature levels, most of which are high (>200°C). Due to its diversity of industries and processes, the business cluster at Klimahafen Gelsenkirchen serves as a model for a large number of small and medium-sized enterprises facing similar challenges. www.klimahafen-gelsenkirchen.de

ZINQ Group

ZINQ has specialized in surface technology since 1889 and is now Europe’s market leader in the

field of corrosion protection for steel using zinc. The family-owned company develops and applies sustainable surface treatments that protect steel products from rust for decades (up to over 100 years) without requiring maintenance. ZINQ's annual production volume amounts to 550,000 metric tons of steel across more than 50 locations in Germany, Belgium, the Netherlands, France, and Poland.

The subsidiary ZINQ Technologie grants licenses for innovative and sustainable surface technologies developed by 40 employees at the R&D center in Gelsenkirchen.

As a climate protection company, ZINQ is a pioneer of the circular transformation: with material-sound, low-carbon processes and products, closed material cycles, and Cradle to Cradle® surfaces. The Planet ZINQ circular business model defines the path to "true" climate neutrality as defined by the EU Ecodesign Regulation (EU-ESPR) through products of Triple-Zero quality (zero carbon, zero waste, zero pollution).

In September 2025, the company's management was awarded the German Environmental Prize by the German Federal Environmental Foundation (DBU) for the Planet ZINQ circular business model. The German Environmental Prize is Europe's most prestigious environmental award and comes with a prize of €500,000.

www.zinq.com

Links to DBU Studies

Studie 2022:

Handlungsfeldanalyse zur Dekarbonisierung der industriellen Prozesswärme im energieintensiven Mittelstand am Beispiel des Klimahafens Gelsenkirchen als klimaneutraler Industrie- und Logistikstandort

www.dbu.de/projektdatenbank/38168-01

Studie 2025:

Praxisnahe Untersuchung zur netzdienlichen Nutzung der Erzeugung von Prozesswärme durch hybride Energiezufuhr

www.dbu.de/projektdatenbank/39527-01

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