

THE OFFICIAL MAGAZINE OF THE PORT OF HAMBURG | JULY 2017

FOCUS ON INDUSTRY

PORT OF HAMBURG
MAGAZINE

Dear Readers,



Just recently the Hamburg Senate presented revenue totals for industrial companies in Hamburg. For the first three months of the year, these totalled 18.2 billion euros, an almost 19 % increase on the same quarter of last year. The trend was especially positive for such highly important sectors for Hamburg as oil processing, metal production/processing, and vehicle manufacture in the aviation and shipbuilding industries.

The Port of Hamburg is of special importance in this context, having already offered the basis for settlement of industrial companies back at the beginning of the 20th century. Talking of the Hanseatic City of Hamburg, thoughts turn first to the port. Yet Hamburg is not just one of the world's leading transshipment hubs. As Germany's third largest industrial conurbation, Hamburg is also one of Europe's top industrial regions. Many industrial concerns are immediately adjacent to the port. Its efficient transPORT infrastructure and the short distances to cargo handling facilities offer optimal conditions for an exchange of goods with trading partners all over the world. The Port of Hamburg therefore performs an essential function in industrial supply and waste logistics in Hamburg and the Metropolitan Region.

Against this background, in this issue of the Magazine we examine the port's significance for industry more closely. We introduce industrial concerns in the Port of Hamburg and look at the challenges involved in having a port close to the city and containing a strong industrial element. We offer a platform for terminal operators and industrial companies and report on future trends.

I wish you enjoyable reading and trust that you will gain some useful insights.

A handwritten signature in blue ink, appearing to read 'Axel Mattern'.

Axel Mattern

Joint CEO, Port of Hamburg Marketing e.V.



**HAMBURG IS NOT JUST ONE OF THE WORLD'S
LEADING TRANSHIPMENT HUBS. THE CITY IS ALSO
ONE OF EUROPE'S TOP INDUSTRIAL REGIONS.**



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Well positioned: Hamburg as an industrial conurbation

Boatbuilding and shipbuilding (approx. 70 ha)

Supply and waste disposal (approx. 107 hectares)

Construction industry (25 ha)

Metal production and manufacture of metal products (approx. 219 ha)

Oil processing (approx. 390 ha)

As Germany's third largest concentration of industry, the Hamburg Metropolitan Region is among Europe's top industrial regions. Between the North Sea and the Baltic and with the Elbe and the Hanseatic City of Hamburg at its heart, for national and international companies this is a highly attractive area with a high quality of life.

Hamburg Metropolitan Region's excellent transport services overseas and with its European hinterland, along with the great range of logistics activities centred on the port area, are the essential qualities that give it serious credentials as a manufacturing centre. With a population of around five million, it can also offer a host of highly trained workers, making it an attractive base for German and international companies. Hamburg's industry is today intensely diverse. Many glittering names stand for successful concerns based in Hamburg or the Metropolitan Region. Among these are Montblanc, Unilever, Beiersdorf with its world-famous Nivea and Tesa brands; Still, Jungheinrich; engineering firms like Dolmar, Hauni and Thyssen Escalators; and Airbus as well as Lufthansa-Technik. Hamburg is the world's third largest aircraft manufacturing location and also plays a leading part in the renewable energies sector.

With more than 32,000 trading companies and over 125,000 employees in the sector, Hamburg is also Germany's largest trade hub. Profiting from this are a great variety of services in the insurance and financial sectors that are closely associated with Hamburg. The Hanseatic City is one of the most dynamic conurbations in the European Union, and a magnet for companies, institutions and skilled workers from all over the world. Around 250,000 Hamburgians from choice, from 185 countries, currently live and work in Hamburg. More than 550 companies from

China have bases in Hamburg, plus around 100 from Japan, 50 from Taiwan, as well as others from Korea and SE Asia, making the city Germany's top centre of expertise on Asia. Other companies from the USA, the United Kingdom, Central and Eastern Europe often run their activities in the German-speaking region from Hamburg. Internationally, Hamburg has meanwhile established itself as a leading centre of hydrogen and fuel cell technology. Along with Nordex, Siemens and Senvion, each with head offices in Hamburg, six additional leading wind power equipment manufacturers have branches there. Leading players in project development for offshore wind farms, e.g. Dong Energy, Vattenfall Europe Windkraft, EnBW, E.ON Climate & Renewables and RWE Innogy, round off the Hamburg portfolio in this sector.

It was recognized in Hamburg at an early stage that economic progress and the application of new technologies are increasingly accomplished through networking between companies, universities and research facilities. Since 2001 the city has therefore promoted its traditional strengths through an active cluster policy, at the same time expanding those areas most essential for the future.

THE PORT OF HAMBURG AS AN ECONOMIC AND INDUSTRIAL POWERHOUSE

As Germany's third largest manufacturing centre, the Hamburg Metropolitan Region is among Europe's top in-

THE PORT OF HAMBURG SERVES AS A BASE FOR 18 SECTORS OF INDUSTRY. JUST FIVE OF THESE UTILIZE ALMOST 90 PERCENT OF THE AVAILABLE SPACE.

Sewage disposal / treatment

Water supply

Environmental waste disposal

Energy

Chemicals (incl. gases, fertilizers)

Manufacture of electrical equipment

Manufacture of concrete, cement and plaster products

Manufacture of rubber and plastic goods

Manufacture of commercial vehicles and spares

Timber processing

Engineering

Recycling

Processing industry (food, mills, feedstuffs, fish, coffee)

Industrial regions. Situated between the North Sea and the Baltic, and centred on the Elbe and the Hanseatic City of Hamburg, for national and international companies the region is a highly attractive area for doing business, offering a high quality of life. Importing and exporting trade and industry profit from the Port of Hamburg's extensive range of logistics and cargo handling services. Covering a total of 7,200 hectares – or one-tenth of Hamburg's total area – the Port of Hamburg is not only of worldwide significance as one of Europe's top cargo handling hubs, but also the state's largest industrial zone. It's right in the middle of the city too and its industrial importance for the Elbe conurbation fully matches its share of Hamburg's total area. Historically speaking, industry in the Hamburg region is closely interwoven with the maritime sector. Imports of raw materials as well as processing and refinement of these, whether for the domestic market or for export, originally formed the basis for the build-up of production facilities. For some sectors of industry, proximity to water deep enough for ocean-going ships is a crucial argument in choosing a site. When handling and processing immense quantities of raw materials, steelmakers, refineries and power stations profit from short transport distances. The first-class transport infrastructure on water and on land also offers great advantages to exporting and importing industries when sourcing supplies for their production, whether elsewhere in Germany or farther afield.

Hamburg's industry is now broadly based. At barely any other location in Europe is the basic raw materials sector as concentrated as it is here. In the Port of Hamburg, only 15 kilometres separate Aurubis copper, ArcelorMittal steelworks and the Trimet aluminium smelter. Many

other industrial concerns, for example from the energy sector, propulsion technology, and shipbuilding & engineering, complete the range. Major players have also settled just beyond the limits of the port. Hamburg is the world's third largest civil aircraft production centre. The renewable energy business is also a leading player here.

Manufacturing is of great strategic importance for the development of the city's economy. Industry is a customer for many suppliers and other sectors of the economy, also stimulating technological research in many directions. It is also a guarantor of prosperity and growth. Industry ensures throughput and added value for the port, and tax income and jobs for the city. In the Metropolitan Region over 155,000 jobs directly or indirectly depend on the port, many of them in industry. Hamburg Statistical Office puts the number of industrial concerns with over twenty staff at 433. In 2015, their revenues totalled 70.49 billion euros and they employed 85,600 people.

INDUSTRY IN THE PORT – LEGALLY REGULATED ADDED VALUE FOR THE CITY AND ITS CITIZENS

Settlement of industrial operations in the port is defined by Hamburg's Port Development Regulations. This legal framework stipulates which areas may be used exclusively for port purposes. This reveals the zone in the port available for industrial settlement. A total of 926 hectares are currently in industrial use, or almost 22 percent of Port of Hamburg's land area. Deliberate settlement of industries with promise for the future strengthens the port in the long term against economic fluctuations. Hamburg Port Autho-

The Hanseatic City is one of the most dynamic conurbations in the European Union, and a magnet for companies, institutions and skilled workers from all over the world.

riety (HPA) is responsible in the city for port management, conducting market research and sectoral screenings specifically to strengthen the Port of Hamburg's international position and positively influence economic development. The aim is to gain appropriate seaport-related operations for Hamburg. The availability of suitable areas for expansion and relocation for the companies involved, also of sites for new settlements, is crucial here. As part of a market survey, HPA is currently staging an International Ideas Contest aimed at achieving development of the Steinwerder-Süd area of the port that is market-compatible and abreast of the times. HPA is planning to develop this 42-hectare area in a central part of the Port of Hamburg with an emphasis on future prospects. ■

THE UNILEVER CONSUMER GOODS GROUP WAS AMONG THE FIRST COMPANIES IN HAFENCITY. OVER 500 HAVE MEANWHILE SETTLED THERE. AFTER COMPLETION OF THE DISTRICT, AT LEAST 45,000 JOBS WILL HAVE BEEN CREATED, AROUND 35,000 OF THESE AS OFFICE JOBS.



Hamburg's successful one-stop development agency

Hamburg's development agency is a success. In 2016 alone, more than 500 companies were assisted with settlement, expansion, the search for premises, or licensing issues.

The team around Dr Rolf Strittmatter, CEO of HWF Hamburg Business Development Corporation, is meanwhile operating as a one-stop agency. "Along with traditional consultancy services, we supply comprehensive local data and assist investors from abroad in founding companies. We also offer help in obtaining residence and work permits. Last year, our reorientation as a one-stop agency helped us to introduce 296 companies to specialized institutions in the Hamburg promotion network," explains Dr Strittmatter.

HWF can be proud of its achievements. 101 companies from Germany and elsewhere have been settled here as newcomers or assisted with expansion. Three of them were found bases in the Hamburg Metropolitan Region. That produced 1,660 new jobs in Hamburg and underpinned 5,062 others. These involved investments totalling 592 million euros. Another 400 companies were given advice. Demand was especially heavy for consultation on start-ups from StartHub Nextmedia, a landmark initiative for the media and digital economy that is based with HWF. The top foreign market was China with 17 settlements. HWF's largest project in 2016 was the award to Deutsche Post DHL of the HUB + Neuland logistics park in the southern borough of Harburg.

'The arrival of Deutsche Post-DHL shows that even projects involving large number of jobs are feasible in Hamburg, provided that suitable sites are available. To ensure that this will also be the case in future, HWF will be developing additional sites for commercial use and marketing the city's existing ones directly,' says Dr Strittmatter. 'Our figures for 2016 are extremely gratifying. Yet we don't want to rest on our laurels, still further expanding HWF's service at the beginning of the year. For companies from industry and commerce, research & innovation, the digital economy & e-commerce, as well as services and tourism, we now have additional dedicated contacts. We anticipate further positive effects from that,' adds Dr Strittmatter.

HWF's ,International Companies / Settlement' team backs companies wishing to settle in the Hamburg business region with comprehensive, free service.

HWF's ,International Companies / Settlement' team backs companies wishing to settle in the Hamburg business region with comprehensive, free service. The range here is directed at companies from both Germany and elsewhere. This ranges from locational advice to a commercial property service, to consultation for investors. For companies in renewable energies, logistics, aerospace, the maritime industry, as well as the media, IT and telecommunications (MITT), as an extra service HWF offers sector-special services. ■

Plenty of space for newcomers

About 13,000 companies settle for the first time in the Hamburg Metropolitan Region every year. The region possesses well over 5,000 hectares of commercial space. In terms of figures, this is far more than the forecast for new settlements would suggest. Commercial sites are a resource like power, water or workers. Since commercial space comprises properties, their value is invariably to be seen in connection with other space-related factors. By 2025, about 1,430 hectares of commercial space will be

required throughout the Hamburg Metropolitan Region. The requirement is calculated on the basis of the forecast development of companies, with demand, mainly from the anticipated trend in numbers employed. In the Free and Hanseatic City of Hamburg alone, experts put demand over not quite the next 15 years at 355 hectares. The picture is very different in areas farther from the heart of the region. In some of these, calculations indicate demand of only just under 20 hectares.

“HHLA has always seen itself as a partner for trade and industry.”

In the Port of Hamburg, one of Europe’s largest, industrial concerns jostle for places with cargo handlers and logistics providers. Hamburger Hafen und Logistik AG (HHLA) stands out in this cluster, running several terminals and logistics providers. The group is one of Europe’s premier port and logistics groups, and among the biggest employers on its home patch. As chair of its Executive Board since the beginning of this year, Angela Titzrath has headed the operations of this logistics player. She has already sat in top management of various groups, and has firm visions for HHLA’s future.



Industry 4.0 stands for intelligent networking of product development, production, logistics and customers – the top theme in the industrial sector. In the Port of Hamburg too, digital networking arrived long ago. Hamburg has positioned itself internationally as the smartPORT. Just recently you said: “HHLA should be the driving force in the digital transformation of the Port of Hamburg.” What exactly are you planning here?

Titzrath: First, I should like to remind you of one thing: The search for innovative IT-based solutions has always played a big part in the HHLA story. The idea of

program for promoting research into the interaction between man and machine. A small HHLA team is currently seeking to identify addition fields for action. There I would add that we don’t want to leave it at identification, but also want to take initiatives further in a way that boosts value.

HHLA’s competence in planning efficient transport chains is beyond dispute. In the course of Industry 4.0, transport logistics will play an even more important role. Does HHLA see itself as a future partner for trade and industry in directing complex logistics flows?

“The idea of an almost fully-automated container terminal, for instance, was born at HHLA. Then the group successfully implemented it in Altenwerder.”

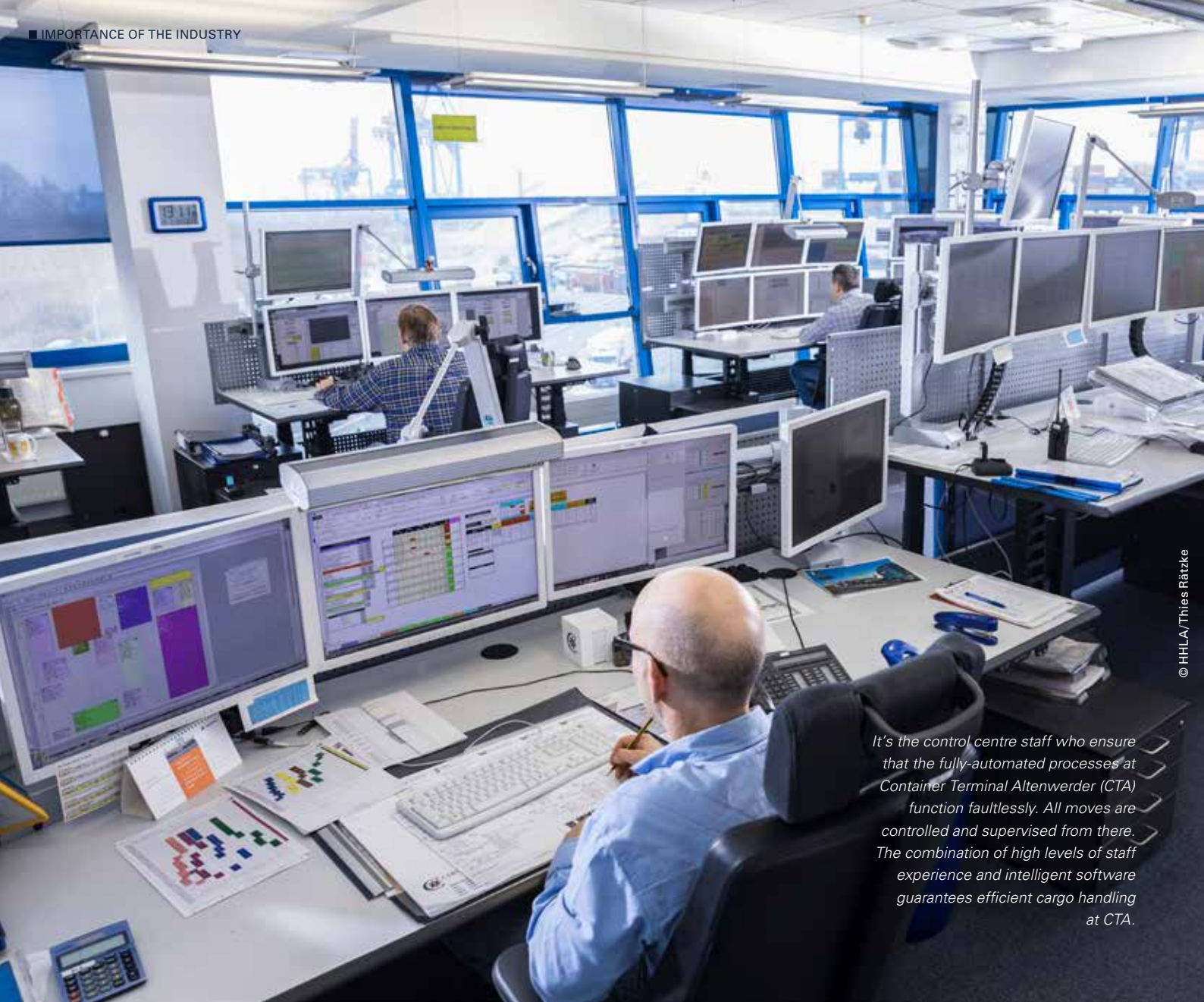
an almost fully-automated container terminal, for instance, was born at HHLA. Then the group successfully implemented it in Altenwerder. So we are not starting from scratch in wishing to pool our skills and resources even more thoroughly, boosting the value of the group with digital solutions. We aim both to build up a network to that end, also to expand existing networks and cooperate with strong partners. That’s why we are in on the Senate’s initiative for digital hub logistics. Other examples for successful network cooperation by HHLA are with Dakosy software and Hamburg Vessel Coordination Center (HVCC). In addition, just now we are participating in a German Ministry of Transport project as part of the IHATEC

HHLA has always seen itself as a partner for trade and industry in directing complex logistics flows. We don’t simply handle containers in the port. Our rail companies Metrans and Polzug operate an extensive European transport and terminal network, and with great success. The intermodal side, which also includes our trucking specialist CTD, has meanwhile attained a 34 percent share of HHLA’s total revenues. Our intermodal subsidiaries therefore play a crucial part in taking freight reaching the Port of Hamburg on to its destination rapidly, reliably and punctually. We see good prospects of growth for this division in future too and shall be investing accordingly. With more than 60 locomotives and 2400 railcars, today we are already one of Europe’s largest rail operators, and this in a hotly contested market. In June we shall be inaugurating an additional rail-hub terminal in Budapest. I am frequently asked whether HHLA shouldn’t be going more emphatically international. That’s already true of our intermodal division. Thanks to our activities in our hinterland, Hamburg has become an important stop on the maritime Silk Road.

*Angela Titzrath,
Chairwoman
of the HHLA
Executive Board*



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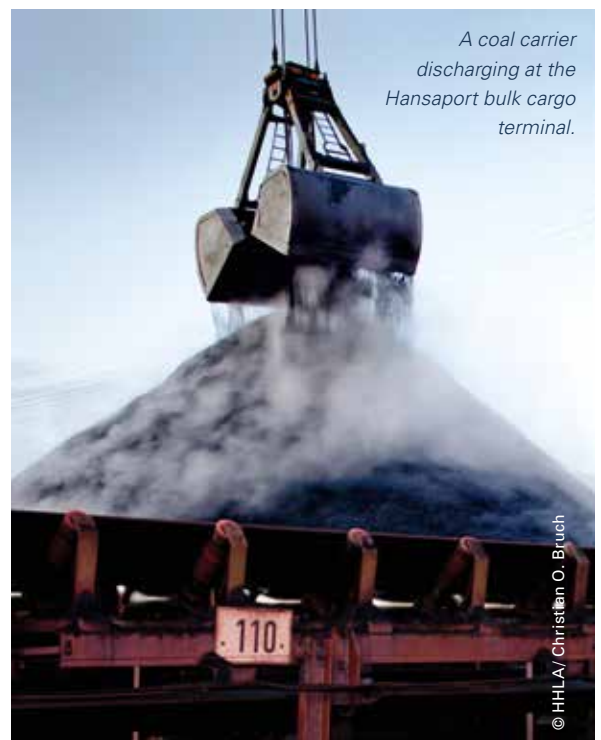
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It's the control centre staff who ensure that the fully-automated processes at Container Terminal Altenwerder (CTA) function faultlessly. All moves are controlled and supervised from there. The combination of high levels of staff experience and intelligent software guarantees efficient cargo handling at CTA.

Hansaport, Germany's largest bulk cargo terminal is truly a paragon, of both digitalization and functioning cooperation with industry. The operating company in Hamburg is jointly owned by you and Salzgitter AG. How did that happen? And how does this cooperation actually look?

“This year we can look back over cooperation with Salzgitter at Hansaport that has lasted for over forty years”

This year we can look back over cooperation with Salzgitter at Hansaport that has lasted for over forty years. And there is massive evidence for how successfully this partnership has developed in a challenging market environment: Now covering 65



A coal carrier discharging at the Hansaport bulk cargo terminal.

© HHLA/ Christian O. Bruch

HANSAPORT is Germany's largest seaport terminal for bulk cargoes and one of the most modern facilities in the Port of Hamburg.

hectares, the facility annually handles 15 million tons of cargo, or more than ten percent of total throughput in the entire Port of Hamburg. Mind you, at the birth of this cooperation barely anybody dared hope for success on that scale. In the mid-1970s, scepticism prevailed on whether the bulk cargo business could put down roots in the Port of Hamburg. Other European seaports, namely, had already gained a head start. Without capital from Salzgitter, Hansaport would never actually have materialized. The combination of Salzgitter Flachstahl's knowhow in automation technology with HHLA's as a successful terminal operator created a bulk cargo handling facility that meanwhile functions almost completely automatically. It's a stunning example of successful cooperation between industry and the port. Rapid handling of iron ore and coal in Hamburg benefits not simply Salzgitter's steelworks, but the power stations operated throughout the country by electricity companies and public utilities. Hansaport's competitiveness, indeed the whole Port of Hamburg's, will in future depend decisively on whether or not the fairway of the Elbe is finally dredged. ■



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IN 1930 THE PORT OF HAMBURG'S SHIPYARD INDUSTRY WAS THRIVING. CARGO SHIPS LINE THE QUAYS OF THE BLOHM & VOSS SHIPYARD FOR REPAIRS.



The sound is changing – port-based industry in transition

In the early days of the 20th century the Port of Hamburg was a stage offering an ear-splitting din of sounds. In 1913 the performers numbered more than 6,000 vessels, with a booming economy in support. For the growing volume of cargo handled, an area of over 50 hectares served as warehousing. Inside the sheds, dockers pushed and shoved, lifted and lashed the cargoes being transhipped. While toiling along the quay walls was at least as strenuous, and an essential element in port activity, it was the shipyards that mainly supplied the background noise.

For folk unfamiliar with the port, this soundscape must have been far more confusing than impressive. That, at least, was how the German poet Richard Dehmel put it in his poem 'Harbour party', addressed to an audience of strangers to the port in 1913: "Do you not notice [...] the rhythm of the hammer blows from the shipyards, but only just the din and the rattling and clatter." Dehmel saw the din as a sign of the rising importance of Hamburg's port: Noise, dirt and muscle were to make the Hanseatic City a significant economic and industrial powerhouse. Industry generally, as well as engineering and power generation, especially, was to experience a remarkable upswing. Processing and refining strengthened the trend. Imports of food

and drink from overseas, as well as raw materials, made Hamburg a vital source of supplies for the people of Germany.

18,149 oceangoing vessels called at the Port of Hamburg in 1938. Many of them had loaded foods and feedstuffs, including quantities of grain, oil-seeds and -fruits. The port was equipped with the appropriate warehouses, cold stores, and heated fruit premises. That allowed the material imported to be processed by firms near the port. Imported raw materials for industry were also in good hands in Hamburg. Oil, coal, rubber and Co. fired the port's processing industry. Long before World War II, a circuit had been created that required additional branches of industry. Down the years, trading became



more and more fused with industrial activities. The expression 'Hamburg's mercantile industry' emerged. Yet shipbuilding remained the largest sector – and as already indicated, the noisiest.

World War II did nothing to halt the trend – big orders from the German navy initially guaranteed employment along the Elbe. Yet by the end of the war, most of the shipyards had been destroyed in air raids, and any still functioning equipment was dismantled as a contribution towards reparations. Shipbuilding collapsed and with it much of Hamburg's industry. Related production lines, for example the manufacture of compasses and measuring instruments, suffered a massive reversal. That Hamburg as a port centre would not have been able to cover the needs for repair of ships arriving there naturally affected imports and exports, as just one of many post-war factors. At over 18 million tons, almost six times more cargo was handled in the last pre-war year than in 1946.

The reconstruction measures that followed contributed to an initial upswing in the port industry. Around 1500 sunken vessels had to be raised from harbour basins and fairways. The Royal Navy brought together divers and salvage companies from the Elbe area to do the job. Also in cooperation with the occupying power, or the Regional Port Controller, it was agreed that by 1949, the Port of Hamburg's capacity should be restored to 70 per cent of its pre-war level.

Ten years later, there were 508 industrial enterprises in Hamburg-Mitte or central borough – that covers most of the port. These included 54 from the chemical industry, 46 from the stone/earth/tin & metal wares sector, 30 engineering firms, and ten companies in the oil refining business. In the food and drink processing sector, coffee/tea was the largest player with 18 firms. In shipbuilding, 27 shipyards with 30,795 employees comprised almost one-third of all those working in industry in the borough. It's interesting to note that revenues of the refineries, with a workforce of not quite 4000, were more than twice as high as those in shipbuilding.

Subsequent years saw the foundations laid for the largest industrial operation now located in the port. In July 1967, ministers from France, Germany and the United Kingdom agreed on an alliance to enable European competitiveness to be maintained in aviation. Airbus Group emerged, and now employs more than 10,000 staff at its Finkenwerder base.

Aurubis AG is not just the Port of Hamburg's leading copper concern, but Europe's, and also the largest copper recycler worldwide. This smelter had its beginnings in the 18th century. It experienced mas-

sive upturns during the world wars as a military supplier. Yet the plant at North German Refineries, as Aurubis was known then, was not spared the effects of war. Air raids, coal shortages, staff shortages – with the bulk of the workforce being of military age – and later an asset freeze by the occupying powers, gradually crippled production. The Wirtschaftswunder of the 1950s again brought the company more orders, and by 1952 it employed around 2000 staff. Aurubis has grown from a small silversmith in the heart of Hamburg into a global player in industry, now employing more than 6300 people worldwide.

Processing as well as trading of imported coffee and tea enjoys just as high status in Hamburg as the production of non-edible oils and fats. Of the Port of Hamburg's 20 largest employers, three undertakings operate in this field. Elements of the Port of Hamburg's industrial portfolio in the same size bracket, with 500 – 999 employees, are two companies in the aluminium/steel industry, also others producing cement, rubber goods and coating materials.

Down the years, the pervading everyday din of the port described above has constantly diminished.



COAL-HANDLING IN ALTONA – A PART OF THE PORT IN 1937.

Founded in 1877 by Hermann Blohm and Ernst Voss, Blohm + Voss is meanwhile one of the last surviving shipyards. So shipbuilding no longer stands alone in producing the port soundscape. Instead, the many industries that have emerged now form a harmonious orchestra whose variety shapes the Port of Hamburg's universal diversity. ■



©Aurubis

Copper made in Hamburg

Anybody approaching Hamburg along the A1 autobahn from the south will spot the 100-hectare site from a long way off. Located by the Elbe bridges, almost in central Hamburg, the Aurubis plant dramatically shows that the Hanseatic City is by no means just a port, but an industrial centre too. Aurubis is the world's second biggest copper producer. Today nothing functions without the 'red gold'. Copper is fundamental for the automotive industry, the building trade or electrical engineering. In this interview with 'Port of Hamburg Magazine', Frank Osterhagen, its Vice President Corporate Procurement & Logistics, left us in no doubt that in future too, copper will be won in Hamburg. Now 45, he is an old hand in the copper trade. In 2019 he should be celebrating his 25th anniversary with Aurubis.

PoHM: Aurubis is a company with a long tradition. The copper smelter was founded as the 'Norddeutsche Affinerie' publicly listed company in Hamburg back in 1866. With a workforce of more than 6,400 in over 20 countries, today Aurubis is a group operating internationally in three continents and with production sites in Europe and the USA. What part does Hamburg as a base play in the group?

Osterhagen: Hamburg is the group's largest production site worldwide and is also its headquarters. 2,300 staff work there 24/7, at least 1,400 in production. Around 420,000 tons of marketable cathodes are produced here 24 hours a day, seven days a week. The worldwide group total is around 1.1 million tons. These cathodes – square panels of the purest copper, weighing between 50 and 80 kilograms – are the base prod-

uct for semi-finished production. As a fully-integrated plant, we work along the entire value-added chain, mainly processing copper cathodes into continuous wire rod and shapes or rolled shapes. Our output also includes precious metals such as gold and silver, and a number of further products like sulphuric acid and iron-silicate stone as by-products of copper production.

Is Hamburg really an attractive location for a company in heavy industry, especially as regards pressure on costs?

Germany is unquestionably a high-cost location. Countries like China or India can certainly smelt copper far more economically. But they cannot do it as well or efficiently as we do. Our HQ plant in Hamburg is technologically one of the world's best. Our competitive edge at this site is based on knowhow and technical stand-

ards. Our customers really appreciate that. In Hamburg we also enjoy the immense advantage that we are at the heart of European markets, which besides China are among the largest customers for copper products. That enables us to react to enquiries from our clients rapidly and flexibly. That is also a tremendous competitive advantage.

In Hamburg you produce more than one third of worldwide group output of copper cathodes. For that, the plant needs vast quantities of raw materials. How do they reach Hamburg? And where from?

We import the bulk of the copper concentrates we process directly by sea from copper mines in various countries of origin. Copper ore is mined mainly in Central & South America and Canada, but also in Africa, Asia & Australia, and to a very small extent in Europe. In addition, we secure recycling material in the most diverse formats. We use surplus electrical and electronic junk, cables, granulated cable, and copper-bearing industrial residues.

So do the gigantic quantities imported by Aurubis make a site immediately adjacent to the Port of Hamburg a crucial advantage?

Proximity to the port offers us decisive benefits. We annually receive over a million tons of copper concentrate by water for our copper production. In addition we accept so-called complex materials, or ores in special compounds, as well as recycling materials and aggregates. Direct proximity to the port is also vital for our sales logistics. Short pre- and post-carriage distances create cost and time advantages. The bulk of the sulphuric acid we produce is despatched by water.



Frank Osterhagen

is responsible at Aurubis Group for purchasing and logistics.

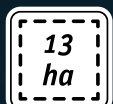
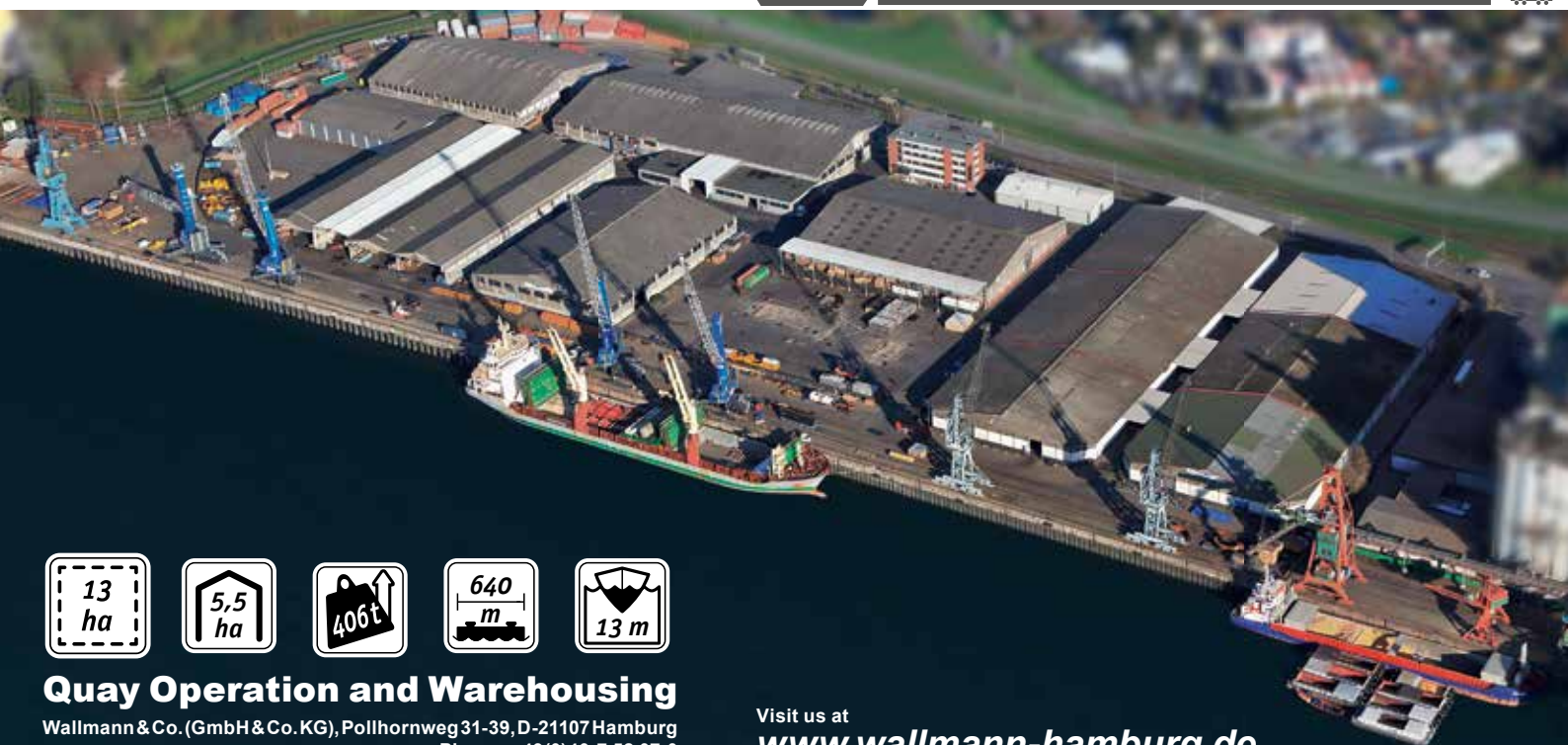
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With Brunsbüttel Ports, a few years ago you found a partner for Hamburg's raw material logistics. How did that happen?

We have cooperated with Brunsbüttel Ports since 2007. At the time, they presented us with a persuasive overall concept for the raw material flow to our plant in Hamburg. Brunsbüttel may lie 80 kilometres' away from Hamburg on the Lower Elbe, but has a persuasive argument with its very large warehousing capacity, and superb flexibility and reliability. To date, a total of over eleven million tons of copper concentrates have been delivered from overseas in the Elbe Port of Brunsbüttel by bulkers, handled and then stored temporarily and correctly by type. The site covers 17,000 square metres. Twice a day, an inland waterway barge shuttle supplies us with a total of 3,500 tons of copper concentrates, the plant's daily requirement.

Can being located in the Peute area, almost in the middle of Hamburg, also involve something of a downside for Aurubis?

In the copper industry, our location is unique. When the site emerged, the main watchword was to position the plant outside the city. At the time, that ap-

plied. Nowadays trade, industry and housing all lie side by side. The situation creates challenges that we have had to face and continue to confront. Our strong commitment to environmental protection has made us one of the world's cleanest copper smelters. Meanwhile, many of our competitors have also been obliged to invest in the areas of environmental protection and energy efficiency, and to catch up. For us, the time that has elapsed means a clear competitive advantage.

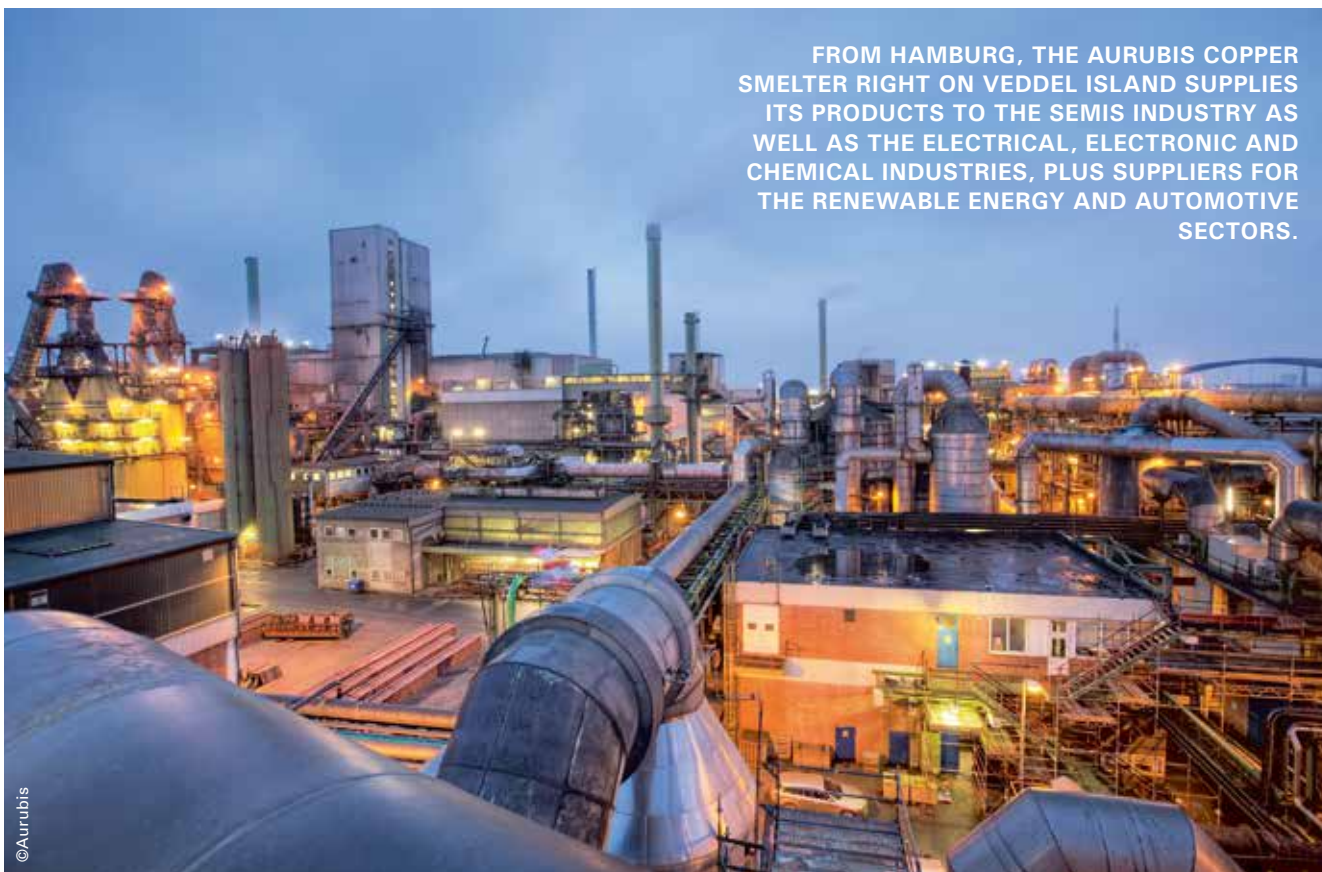
A 'New Vision 2025' for Aurubis was presented at the Annual General Meeting at the beginning of March. Does that change anything for the Hamburg site?

We assume that gaining purest copper from ore will also constitute an important part of our business in future. However, we aim for a broader base, to further enlarge our profile in respect of the production of various metals such as gold, silver, nickel, selenium and others, which we are also producing now. That may involve the expansion of existing capacities, but also acquisitions, where these fundamentally and geographically make sense. We want to pursue this course along with our partners in order to secure our future. ■



THE MIXTURE OF CONCENTRATES OF VARIOUS TYPES PLUS SAND TO FORM IRON-SILICATE STONE IS INITIALLY DRIED AND THEN SMELTED AT OVER 1,200° C. IN THE FLASH SMELTER, WITH OXYGEN BEING ADDED, TO FORM COPPER STONE AND IRON-SILICATE SLUDGE.

FROM HAMBURG, THE AURUBIS COPPER SMELTER RIGHT ON VEDDEL ISLAND SUPPLIES ITS PRODUCTS TO THE SEMIS INDUSTRY AS WELL AS THE ELECTRICAL, ELECTRONIC AND CHEMICAL INDUSTRIES, PLUS SUPPLIERS FOR THE RENEWABLE ENERGY AND AUTOMOTIVE SECTORS.



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A MISLEADING IMPRESSION: IT MAY BE DEAFENING AND DIRTY DOWN AT ARCELORMITTAL, BUT ITS HAMBURG PLANT IS AMONG EUROPE'S MOST INNOVATIVE AND STATE-OF-THE-ART STEELWORKS.



ArcelorMittal Hamburg

The foundation stone for the construction of an electric steelmaking plant was laid at Dradenauhafen in 1969. The technology of converting iron ore into sponge iron, using natural gas, and then melting this down with scrap with the aid of electric power, was revolutionary at the time. After a bankruptcy in the meantime and a fresh start, in 1995 Lakshmi N. Mittal from India acquired the Hamburg Steel-

works. With a workforce of 550 and annual production of around one million tons of steel, the works now belongs to ArcelorMittal, the world's largest steel producer, which apart from Hamburg runs three other plants in Germany. The electric steelworks in Hamburg is regarded as the world's most energy-efficient plant of its type. hamburg.arcelormittal.com

The advantage of a 'wet' steelworks

One of Europe's most innovative steelworks stands in the Port of Hamburg. Unlike other plants, the one owned by ArcelorMittal, the world's largest steel group, is not operated with coke as the reducing agent, but with natural gas and electric power. So the electric steelworks is seen as being especially low-emission and energy-efficient. When it was set up at the end of the 1960s, special consideration was given to its location. Thanks to its site alongside water sufficiently deep for ocean-going ships, the plant benefits from short transport runs. And every year, the port can be happy about the immense volume of raw materials and finished products handled.

Anybody who believes that electric current is noiseless is taught to know better in ArcelorMittal's electric steelworks in Hamburg-Waltershof. There is a tremendous din in the gigantic smelting hall. Earplugs are just as much part of the obligatory outfit as protective helmets and fireproof clothing. Once an hour, the din grows even more colossal when around 40 tons of scrap fall into the fiery electric arc furnace.

As soon as the three graphite electrodes sink into the

furnace and the electric arc ignites, making oneself understood is impossible except with gestures. Flames shoot metres high toward the roof and smoke billows upwards.

As the noise gradually diminishes, the temperature in the furnace is around 1600°C. Now the control console adds sponge iron to the molten scrap. Sponge iron consists of pure iron pellets from the plant's own direct reduction unit, the only one in Western Europe.

The smelting process produces 150 tons of raw steel, which in a further process have alloys added and are poured into moulds for steel billets weighing 1.5 tons. In a further production process, these are converted into high-grade wire rod of different qualities and thicknesses.

ArcelorMittal annually produces around one million tons of steel at Dradenastrasse. That may not be much against annual world output of 1.6 billion tons, but nevertheless the Hamburg plant is among the largest wire rod producers in Germany.

'Quality, flexibility and speed are the advantages enabling the Hamburg works to try to assert itself, especially against the Chinese competition with its cheap steel', explains CEO Lutz Bandusch. China is responsible for around 50 percent of worldwide steel production and with its capacity surpluses and dumping prices, has in recent years driven the European steel industry into a serious crisis.

ArcelorMittal in Hamburg can produce up to 300 different types of steel. There is a demand for high-grade quality and stainless steels that are rolled into wire between 5.5 and 16 millimetres thick in its roll-

ing mill. "Our facility enables us to react extremely flexibly to all kinds of customer demands," says Bandusch. "We even supply our medium-sized customers with minimal quantities that may only comprise one truckload." Due to the quantity to be delivered and the distance, orders like that are of no interest to rivals out in East Asia. 80 percent of all wire rod from ArcelorMittal in Hamburg remains in the European market, and 40 percent of its products are delivered to clients in Germany.

Both for loading wire rod and for deliveries of raw materials, the plant's Hamburg location, on water sufficiently deep for oceangoing vessels, plays a crucial part. Bandusch: "Steel is a traditional heavy-lift product, and so not that simple to shift on land. A ship makes the ideal carrier. That's why proximity to water is so vital for us. To this day, we remain grateful to founder Willy Korf for his choice of site."

ArcelorMittal Hamburg annually requires around 900,000 tons of ore for its steel production. Coming as a rule from Canada or Brazil, the ore is handled at the plant's own terminal facility on Dradenauhafen. Bulklers of up to 70,000 grt can berth there. Up to 60

Coal and ore handling in Hamburg

Any plant not possessing the site advantages of a 'wet' steelworks will secure supplies of raw materials via a suitable bulk cargo terminal. Almost 17 million tons of coal and ore (2016 total) are annually imported via Hamburg. The sheer bulk of this creates vast piles of coal and ore covering 350,000 square metres at Hansaport, Germany's largest seaport terminal for dry bulk cargo. Among other plants, steelworks in Salzgitter and Eisenhüttenstadt are supplied from there. Hansaport offers two discharge berths with a water depth of 15.4 metres for ocean-going vessels plus additional berths for coasters and inland waterway craft. An extremely high degree of automation of grab cranes, conveyor belts and rail handling makes Hansaport an especially efficient handling facility for grab cargoes when compared internationally. Depending on the size and type of ship, at Hansaport up to 110,000 tons can be discharged in 24 hours. On-carriage inland of bulk cargoes is by rail or inland waterway craft.

The interplay of unloaders, conveyor belts and shunting locomotives has been largely automated at HANSAPORT.



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percent of the scrap needed is also actually delivered by water.

Dry steelworks, as Bandusch calls units without any access by water, are here at a disadvantage in terms of logistics. "At our 'wet' steelworks, raw materials can flow directly into the production process and require no cost-intensive on-carriage." Just now, with world market prices and high energy prices, saving costs is vital for survival at all.

Despite difficult market conditions, the 550 staff at ArcelorMittal's Hamburg steelworks seemingly need have no worries about their jobs. At the moment, the group is investing 15 million euros in a new walking beam furnace. This investment decision not only provides security for the site on the Elbe and retains an important future customer for the Port of Hamburg, but also ensures that the plant can extend its role as a pioneer of environmental friendliness and energy efficiency: The new furnace will allow an annual 19,000 megawatt-hour reduction in natural gas consumption, also reducing CO2 emissions from the rolling mill by an additional four percent. ■



Lutz Bandusch,
CEO of ArcelorMittal
Hamburg, with a
handful of iron ore.

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More than a 'quick cut & shave'

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'Dry-docking' is entered in block capitals in the sailing schedule of the 'Bright Horizon' from the 17th to the 29th May. That means: a yard laytime in Hamburg for the roughly 30,000 ton multi-purpose freighter owned by Hamburg-based Maritime Carrier Shipping or MACS. The Port of Hamburg is in fact not only an important cargo transshipment hub, but also the centre of a multi-layered maritime industry.

The call at Elbe 17 dock belonging to the Hamburg shipyard, Blohm + Voss had been thoroughly planned by the shipping company. Precisely between two round voyages to South Africa, whose departure and final destination port are both Hamburg, only a few days were available for important maintenance and repair jobs. But for Blohm + Voss shipyard workers, it is a pretty unspectacular assignment: they call it a 'quick cut & shave', when the underwater hull is freed from encrustation by algae and then given a fresh anti-fouling coating. As the yard told Port of Hamburg Magazine, other work carried out was related to the upcoming classification, like the perennial car-test, the deck cranes and hatch covers were overhauled, and the hull above the waterline repainted.

'Elbe 17' Dock, is one of the biggest dry-docks in Europe, with the yard usually mastering challenges of quite another calibre: Here cruise vessels have been spectacularly lengthened: The perhaps best known cruise ship in the world, the 'Queen Mary 2' regularly docks here for repairs, maintenance and remodelling, but then, there's not much space left for manoeuvring, because the 345-metre-long liner fills the dock completely, with the hull almost touching the side walls. Set against that, the 'Bright Horizon' at 193 metres in length is a class or two smaller – and yet for the yard, recently taken over by the Bremen-based Lürssen-Werft shipyard, an important order in its efforts to stay afloat against hard competition.



The 'Queen of the Seas' first called at the Port of Hamburg in 2004. The 'Queen Mary 2' has been a regular visitor to the Hanseatic City ever since – being modernized at the Blohm + Voss shipyard in 2016 for around one hundred million euros.

The 'Bright Horizon' calling at the Hamburg dry-dock is just as logical for the shipping company as for the shipyard: The multi-purpose freighter is normally handled in Hamburg at C. Steinweg's Süd-West-Terminal – just a few minutes sailing time away from Blohm + Voss. This keeps the downtime short and, as a consequence, costs for sailing there extremely low. On the other hand, Blohm + Voss profits from the high concentration of liner services in the Port of Hamburg, not only occupying its dock capacity and highly specialized yard workers with demanding, or short-term jobs, rather like a 24/7 car repair shop on a busy main road.

The maritime industry has been one of the important economic factors in Hamburg for decades, with the

traditional Blohm + Voss shipyard, directly opposite the St. Pauli Landing Stages, perhaps its most striking landmark, largely because it is still visible. However, this sector can do a lot more than dry-dock ships. "In Germany, shipbuilding has changed considerably in recent decades and is facing new challenges," explains Jessica Wegener, Hamburg office manager for the North German Maritime Cluster. In this supra-federal state network, maritime industry players and scientists have joined forces to strengthen their competitiveness and innovative capacity. "In Germany, this sector has been set on building containerships for a very long time. Since the global economic and financial crisis there has been a definite, visible trend to specialization," Jessica Wegener recognises. The shipbuilders'

Only a stone's throw away from the Reeperbahn und HafenCity, in central Hamburg the Blohm + Voss shipyard has been designing, building and repairing bulk carriers, containerships, RoRo and cruise ships since 1877.

multiple suppliers in Hamburg are also profiting: Wärt-silä SAM Electronics supplies navigation and monitoring equipment to control ship operations. Amptown Systems Company equips the entertainment areas of passenger ships, such as theatres, cinemas and bars, with multi-media technology. The ships' engine manufacturer MAN runs a service centre in the port for diesel power units and turbochargers, operating 24/7. These are only three examples of many successful companies.

One important topic increasingly affecting the maritime sector for some years has been the maritime environment, and consequently increased efficiency. This has called people like Dirk Lehmann, the managing partner of Becker Marine Systems, into action. Based in the south of Hamburg, the company develops innovative ideas across the board for 'Green Shipping'. The company recently proved its innovative ability with a novel concept for

“There is hardly another location in Germany, where so much maritime expertise is concentrated, as here in the Metropolitan Region.”

creating electrical power: Together with Aida Cruises, Becker Marine Systems developed a floating power station, using liquefied natural gas (LNG) as fuel. Since 2015, this LNG barge has been able to supply cruise ships in the Port of Hamburg with electricity during lay-time, sustainably reducing hazardous emissions.

A further example for successful specialization in shipbuilding is Sietas-Werft. The shipbuilder, established in 1635, is one of the oldest operations in Hamburg and had concentrated on building smaller and medium-sized containerships. Finding itself in difficult economic waters, the yard had to file for insolvency in 2011. Sietas received help from the Pella shipyard



group, from Hamburg's city-twinning partner St. Petersburg, as a new partner. Sietas has emerged from the crisis strengthened, now successfully concentrating on building ships' hold suction dredgers, port ferries and hull elements for other yards. The former Sietas subsidiary, Norderwerft shipyard on Reiherstieg Canal, like Blohm + Voss, was also taken over several years ago by Lürssen. With its three floating docks, today Norderwerft concentrates on maintenance and repair of feederships.

Maritime research also offers specialists a wide and innovative spectrum of research and vocational training opportunities in Hamburg: At TUHH - the Technical University of Hamburg-Harburg alone, twelve different institutes are researching maritime systems, trying to design more efficient, safer ships.

A further example is the Hamburg Ship Model Basin (HS-VA). For over 100 years, the newest hull types have been tested for their hydro-mechanical properties, and analysed in a 300-metre-long test tank, complete with the motion of the sea. For especially extensive simulations, ships' models can be tested under extreme climatic operating scenarios, even in one of the world's largest ice tanks.

“The Hamburg Metropolitan Region is an important location for the maritime industry,” stresses Wegener: “We have a very strong mix of sectors. In my opinion, there is hardly another location in Germany, where so much maritime expertise is concentrated, as here in the Metropolitan Region.” ■



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Of the international oil majors, Shell is the largest investor in research & development. Among Shell's Hamburg facilities is its Global Centre of Fuel Expertise.

'Shell's heart in Germany beats in Hamburg'

For some years the European oil industry has been fighting drastic capacity surpluses in the refinery sector. Demand for petrol has fallen in line with less and less thirsty car engines. On top of that, the USA barely figures at all on the market as a major customer for petrol from Germany. The country has expanded its own refinery capacities, and the US market is also shrinking. In recent years, oil majors have gradually withdrawn from the refinery business in Europe.

A forecast by the German Oil Industry Federation (MWV) predicts an eight percent fall in annual sales in Germany to 97.5 million tons by 2020 and a further five percent drop to 92 million tons by 2025. Specialization plus centralization are therefore the magic formula. These were some of the reasons prompting the Shell oil company to decide in 2009 to sell its refinery in the southern borough of Harburg. The new owner is Nynas from Sweden, a company going for the production of special oils instead of petrol and diesel fuel. The state-of-the-art special lubricants refinery now produces bitumen and speciality naphthenic oils that industry uses as a basis, for mixing or as operating material.

Shell has nevertheless remained loyal to Hamburg. At the centre of the Port of Hamburg, Shell's Grasbrook Lubricants Centre is one of the group's largest lubricants plants. Less than 500 metres away as the crow flies, on Hoher Schaar in Wilhelmsburg, Shell operates its worldwide research laboratory for fuel and lubricants as well as a tank farm supplying the city and the surrounding region with heating oil, diesel and petrol. 'Shell's heart in Germany beats in Hamburg,' says Stijn van Els, Managing Director of Deutsche Shell Holding. Of over 70 countries where the group is active, Germany is one of the most important markets, and Hamburg is a vital base for the company there. Employing almost 1000 staff, the

headquarters of Shell Deutschland Oil is located near the airport in the North of Hamburg.

At the Shell Grasbrook Lubricants Centre, around 300 employees produce quality lubricants for customers from the automotive industry, the chemical, technical, cosmetics and tyre industries, and the energy sector. With an annual production capacity of approx. 350,000 tons, this unit is one of Shell's largest plants. Daily, ships bring basic oils from countries like the USA, South Korea, the Netherlands and Qatar.

The Western edge of Shell Grasbrook Lubricants Centre lies on the water at Reiherstieg. Inland waterway tankers with capacities of 700 to 1000 tons of base oil call here daily, and ocean-going tankers (with up to 6,000 tons of base oil) every week. The base oils are pumped from the jetty via pipelines to the plant's base oil tanks. The next stage consists of two oil mixers. Here the various ingredients are mixed



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One-litre bottles of Shell Helix Ultra ECT 0W-30 engine oil being labelled at Shell Grasbrook Lubricants Centre Hamburg, with Elbe Philharmonic Hall in the background. Once filled, these are not kept at the plant itself, but in an external warehouse in the South of Hamburg. This warehouse supplies large areas of the European lubricant market.



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to a special formula into the relevant products. That involves adding special additives to the base oil. These influence the properties of the finished products. Some oils, for example, need to have especially good properties to contend with the cold.

Until being filled, the finished products are parked for the interim in storage tanks. Some lubricants are in continuous production, others on commission from customers. Storage time can therefore vary from a few days to several weeks.

In the filling unit, finished products are filled into special containers. These vary from one-litre bottles, two-litre buckets and special 209-litre barrels to 1000-litre plastic containers. However, a high proportion of lubricants is loaded directly into road tankers, with seven filling points handling up to 60 of these every day.

Colleagues at the neighbouring Shell Technology Centre Hamburg on Hoher Schaar juggle with the formulae for lubricants and fuels. This Hamburg laboratory is regarded as the centre of Shell's expertise for fuels, lubricants, marine diesel and power generation, as well as engine, gear and vehicle testing. A total of around 300 chemists and engineers from various disciplines, as well as technicians, mechanics and laboratory assistants, work there on optimizing existing products and developing new ones. This is also the source of Scuderia Ferrari's Formula One race fuel.

Engine dynamometers can simulate all uphill and downhill, straight ahead and serpentine driving conditions – and also different environmental temperatures as low as zero or even below. Exhaust gases can also be retrieved and precisely analysed, i.e. how much CO₂, nitrogen oxide and sooty particles come out of the exhaust pipe. Researchers here are especially proud of the truck driveline. Here the truck is dismantled into its component parts with the aim of precisely illustrating and measuring the interplay of the engine gearbox and axles. The scale can be even larger. In another building, the laboratory contains a test-bed for ship's engines. Since these require fuels that differ from those for cars and trucks, around the corner are twelve large 100 m³ tanks of marine diesel. These are heated day and night to keep them at operating temperature.

In recognition of the Hamburg Research Laboratory's contribution towards Shell's worldwide business and given the significance of the German automotive industry, in recent years Shell Group has invested further in its Hamburg base, creating additional high-grade jobs. ■

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Comforting warmth from industry

In 2018, the Hamburg copper producer Aurubis will heat up the eastern part of Hafencity – literally: Using industrial waste heat a city district in Hamburg can for the first time be almost completely heated. According to information from the environment protection agency this will save about 20,000 tons of CO2 annually.

“In Hamburg we want to show how the energy revolution can also function to provide warmth,” explained Environment Senator Jens Kerstan at the signing of the contract between Aurubis and the energy provider enercity. Up to now a coal-fired power station provided the warmth required: Its output can now be reduced considerably. Around 8,000 households will easily obtain their heating from Aurubis. The heat is produced during

copper smelting when sulphur dioxide, a by-product, is converted into sulphuric acid; all accomplished with almost no CO2 emissions.

CITY AND BUSINESS ACTING TOGETHER TO PROTECT THE ENVIRONMENT

The measures are the result of the ‘Hamburg Environment Partnership’ started in 2003. It was established as voluntary cooperation by Hamburg com-



To exploit the future line path for industrial waste heat, outstanding construction work needs to be carried out.



Aurubis derives heat from what is known as the contact acid plant, in which the gaseous sulphuric oxide formed in the process is converted into liquid sulphuric acid. The plant consists of three lines. Around 160 million kilowatt hours (kWh) of heat per year can be derived from each of these.

panies for environmental and climate protection. More than 1,000 companies are already taking part including Aurubis. Supported by the Hamburg Senate and Hamburg business represented by the Chamber of Commerce, Chamber of Trades & Crafts, the Industry Association and the Hamburg companies association (UVHH). With numerous sponsorship programmes within the framework of this partnership, resource efficiency and voluntary environmental protection will be firmly anchored in Hamburg companies.

The UVHH has been part of the partnership since 2007. Achievements: Through voluntary measures alone, Hamburg's economy is already annually saving over 76,000 tons of CO₂ and 60 million kilowatt-hours of energy, equal to the consumption of almost 2,000 private households. This effect can be realized, for example by extending photovoltaic, building a new district heating power station and wind turbines as well as recovering energy from gantry cranes and upgrading to more energy efficient lighting systems. As Norman Zurke, CEO of UVHH states: 'The working programme of the environmental partnership offers not

only industry, but also port companies the opportunity to recognize and use potential for conserving resources through consultation and support programmes. We will continue along the chosen road and be actively involved in climate protection in the future.'

SHARING EXPERTISE

Over and above the environmental partnership in Hamburg, last year 13 large production companies came together in the 'Energy efficiency network for Hamburg industry'. In addition to Aurubis, other metal producers Arcelor Mittal and Trimet Aluminium, the Mercedes-Benz plant, Lufthansa Technik and Holborn Refinery Europe are involved in the project. The Industry Association of Hamburg is the supporter of this network. All companies involved have committed together to a reduction in CO₂ emissions of 60,000 tons per year by the end of 2018. Regularly sharing expertise between the energy experts of all companies involved should help to achieve this ambitious goal. ■



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Peter Sander, head of Emerging Technology & Concepts Deutschland with Airbus Operations, is holding a Victoria lily pad and a bionic-spoiler model, printed from aluminium. Airbus has copied the stable, intelligent structures from nature, testing these, e.g. in a spoiler. The model shown has been reduced down to 600 mm, whereas the original component part is between 1.8 and 2.1 metres in size, depending on the type of aircraft.



Layer for layer: 3D printing is on the march

Hamburg is very well positioned as an innovation and scientific hub with a wide choice of university courses, numerous research institutes, innovative companies and a distinctive cluster structure in future-oriented fields: This has not gone unnoticed beyond Hamburg's city limits. But what about 3D printing in the Elbe conurbation? Will fresh opportunities for development emerge for the Metropolitan Region in this market of the future?

Industry is the starting point for the value creation chain and an important cornerstone in Hamburg's economy. With LZN – Laser centre north, Hamburg possesses an institute with distinctive expertise in the field of 3D printing, especially with regard to the aviation industry: It has other areas of application, too, such as shipbuilding and medical engineering. With DLR – the German Aerospace Center - and the Fraunhofer-Gesellschaft, Hamburg has acquired two further important research organisations for the development of 3D printing technology. This topic is of strategic importance for the city, is being included in the industrial masterplan developed jointly by the Senate, Chamber of Commerce, Hamburg Industrial Association and DGB Nord – German Trade Union Confederation North – to create an optimal framework. 'First fruits' are evidence of being on the right

track. In 2016, ZAL TechCenter opened its doors, with companies and scientific institutes working together under one roof on research topics for the civil aviation industry. Their key topics include Industry 4.0 and 3D printing.

Peter Sander, head of Emerging Technology & Concepts Deutschland at Airbus Operations, made very clear where the real interest of the aviation industry lies, when it comes to 3D printing. For the plane manufacturer, reducing weight is the number one priority. When compared to subtractive manufacturing, 3D printing needs considerably less raw material. This makes a great difference when it comes to expensive substances like titanium. It is especially suitable for plane building, because of its stability as a light metal. Applying layer by layer as-

sembly, the metal parts are also considerably lighter. This means savings in fuel, costs and CO2. A further key factor: with 3D printing you need no tools. Directly from the design stage, a product can be produced, tested, modified and produced again. This reduces product development cycles considerably, requiring no big investments. The serial production of 3D titanium components for aircraft production, jointly conceived by Concept Laser and LZN, has even been awarded the 'Deutscher Zukunftspreis' or trendsetting prize.

For Professor Claus Emmelmann Ph.D, CEO of LZN Laser Zentrum Nord and head of the Institute for Laser and Systems Technology at the Technical University of Hamburg-Harburg, 3D printing is not simply about printing instead of milling and drilling. It is about new opportunities for component design, not previously known with conventional processes. This means a paradigm shift away from 'Design for Manufacturing' to 'Manufacturing for Design'. Together with partners such as Airbus und Concept Laser, it has already been shown that this potential can be applied practically for mechanical and thermal com-

ponents with high mechanical loads. However, the diverse opportunities for 3D printing have not yet been implemented in most manufacturing companies. This is why Professor Emmelmann is putting across his expertise and experience in the laser technology expert network, 'Light Alliance 2.0'. ■



What is 3D printing or additive manufacturing?

Using a digital model, three-dimensional objects are compiled layer by layer with the help of a printer. Bonding the layers is carried out using physical or chemical hardening or smelting processes. Popular materials for 3D printing are plastics, metals, and ceramics, but cement and biological materials can also be printed. Depending on the material and field of application, different printing processes are used. Almost any design element can be made. In China, houses have already been built with 3D printing. In tissue engineering, skin and even the first simple organs have been successfully printed.



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PETER PICKHUBEN'S PINBOARD

Liebherr: Industrial settlement in Kuhwerder port basin

Liebherr, manufacturer of mobile port cranes, ship and off-shore cranes as well as construction equipment, is to build a new branch in the Port of Hamburg. On an area of 44,000 square metres, a sales and service location with repair shop mainly for maritime cranes will be established. Building is set to begin in November 2017, and operation planned to start in the first quarter of 2019. On the site in centrally located Kuhwerder port basin there will be a workshop, storage space and an office building. A total of 90 staff will work there. Lieherr-Nenzing had been looking for a site near a port in north Germany for a long time. The restructuring of the land reserves meant that Hamburg Port Authority (HPA) could offer the Swiss mechanical engineers attractive growth potential. "Because of its logistics prerequisites the Hamburg location, has become our central hub for renting out and receiving returned equipment as well as for all kinds of repairs from the whole of Europe," says Jörg Schmidt, CEO, Liebherr-Nenzing Service GmbH.



© HHM / Dietmar Hasenpusch

Liebherr cranes are in service all over world, for example in Hamburg at Wallmann's Multipurpose Terminal.

EXPERIENCE INDUSTRY LIVE! THE LONG NIGHT OF INDUSTRY MAKES IT COME ALIVE

Traditionally industry is fighting against its noisy, dirty image. But it is really modern, innovative and diverse. So that we can all convince ourselves of this, industrial companies open their gates on the Long Night to give the locals a glimpse backstage. Those interested can get to know fascinating industrial companies, attractive employers and committed vocational trainers in the flesh. The Long Night has been staged since 2008 and since then more than 550 companies - both large and small, regional and international, well-known and hidden champions - around 64,000 participants country-wide in 12 regions have taken part in the project. This year too, many familiar favourites are there as well as new companies, from Berlin to Rhine-Ruhr, from Hamburg to the Thuringian Forest. All information on dates, companies taking part and registration can be found on: www.langenachtderindustrie.de.



© Arne Vollstedt

A glimpse behind the scenes at Trimet Aluminium in Hamburg.

A LITTLE BIT OF HAMBURG CAN BE FOUND IN EVERY MERCEDES

In Germany, cars are made in Bavaria and Baden-Württemberg; in Wolfsburg, too. But in Hamburg? The Hanseatic city does not exactly count as one of the automotive strongholds, being better-known for its aerospace industry, medical engineering, renewable energies and naturally the maritime industry. Many Hamburg residents do not know that in the Moorburg district of Hamburg between the A7 autobahn and the coal-fired power station there is a Mercedes Benz plant with 2,500 employees. No finished cars come off the assembly lines, but the facility is an important building block in the global production network for Mercedes Benz cars. Axles and axle components, steering gears, components for emissions technology and lightweight structural components are developed and produced here. From the plant in Moorburg components go to Bremen, Raststadt, to Hungary or are exported to China for final assembly. So in every Mercedes Benz car there are parts from Hamburg. But that is not enough: The Mercedes Benz plant in Hamburg is now moving into hightech production for electromobility. With an investment of 500 million euros the plant is extending its product portfolio to include key components for electromobility. This decision secures the competitiveness of the Hamburg plant, keeping employment stable.



© Daimler AG

How the energy sector and industrial companies are driving the energy revolution



By the end of the year the wind farm in the Port of Hamburg will comprise eleven windpower units. This wind turbine is already in operation at the Köhlbrandhöft sewage plant.

If you think of a wind park, you visualize spacious meadows with wind turbines stretching beyond the horizon, or enormous offshore wind parks on the Baltic or North Sea. Not many people think of a crowded industrial area in the middle of the Port of Hamburg. But this is exactly where companies are driving the energy revolution. The municipal energy provider Hamburg Energie has established six new wind turbines in the industrial port of Hamburg. With these windmills the Hamburg Energie wind park in the port has grown to include a total of eleven turbines. According to CEO Michael Beckereit: "We will then provide over 50% of the energy needs of our over 100,000 customers from our own renewable energy facilities." Since February three new turbines have been erected on the premises of Trimet, aluminium smelters in Altenwerder. With a total height of 199 metres from the ground to the blade tip the three turbines in Trimet's wind park count as the largest in Hamburg. In comparison: The diameter of the rotor is larger than the Elbe Philharmonic Hall is high. Together they produce a total of 28 million kilowatt-hours per year. This covers the energy needs for around 100,000 Hamburg households. Three more turbines stand at the premises of ArcelorMittal Hamburg steel works in Waltershof. After deep foundations have been set in concrete the turbines are planned to be erected in July or August. The three turbines are planned to produce some 23,000 megawatt-hours per year, representing the annual energy needs for over 8,200 households.

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PORTnews: Always brilliantly briefed!

The Port of Hamburg with its large catchment area is an immensely dynamic economic region that produces fresh news of importance virtually daily. The flood of diverse stories from port operations, logistics and shipping, also seaport-hinterland links, make it hard to keep track. Every 14 days, our newsletter PORTnews brings you up-to-date on maritime topics. So you won't miss any significant decisions on port and transport policy, will learn the background reasons for recently forged

alliances, and can brief yourself on staff changes listed in our PORTpeople rubric. In addition, each issue carries tips on maritime functions. So you gain an overview of conferences and transport trade fairs, also such tourism highlights the Port Birthday or Hamburg Cruise Days.

Once registered, you will receive top news from Hamburg and the region handily in your e-mail mailbox. Register right now at.

www.hafen-hamburg.de/de/portnews .

Do you know the hot-off-the-press 'Universal Port of Hamburg' brochure?

Under the slogan 'One Port. Infinite Potential', this new 32-page brochure presents the whole range of services at Germany's largest seaport. Comprehensive and informative, but handy and to the point, the brochure provides a lightning survey of the Port of Hamburg's service diversity. Among the features explained are the well-developed port infrastructure that permits clearance of today's very largest containerships, the innumerable aspects of handling all imaginable cargoes, and the Hamburg Metropolitan Region as a logistics centre. Also covered are the Port of Hamburg's role as Europe's No. 1 rail port, the host of diverse services offered in the port, and hey presto, digitalization.

The brochure 'Universal Port of Hamburg' can be downloaded in German and/or English from the media rubric on the Internet page www.hafen-hamburg.de. A print version can be ordered by e-mail from presse@hafen-hamburg.de.



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