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FEATURES

- Global Coal Trades
- Coal Terminal Developments
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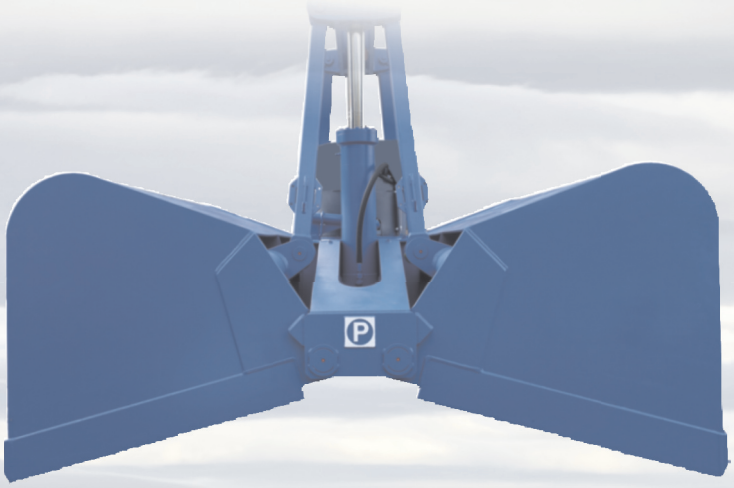

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Slowly growing dry bulk trade

Restraining influences affecting commodity import demand have been prominent in the past twelve months, although in some countries buoyant elements evolved. During last year as a whole global seaborne dry bulk trade growth was very limited, and prospects for 2026 seem similar.

Recent forecasts of economic activity among commodity importing countries suggest that growth momentum is unlikely to strengthen greatly. The International Monetary Fund's mid-January estimates showed world gross domestic product growing at 3.3% in 2025, unchanged from the previous year, while 2026 could see another unchanged 3.3% outcome. In the European Union, Japan and China, stable or lower growth rates are envisaged.

Iron ore

A large part of the increase in world seaborne iron ore trade last year was a result of higher imports into China. These rose by 20mt (million tonnes) or 2%, reaching 1,260mt, even though steel production fell.

Elsewhere there were relatively small increases in other raw materials importing countries, contributing to a global rise of about 2%.

Provisional steel output data published by the World Steel Association shows a widespread pattern of downturns during the past twelve months. The EU and South Korea saw 3% decreases in crude steel production during 2025 compared with the previous year. Japan and China experienced 4% declines, while Taiwan's volume was 11% lower. The outlook for the current year suggests that a pick up that boosts iron ore consumption and imports may be difficult to achieve.

Coal

Tentative signs of how the coal trade trend is likely to unfold over the year ahead point to a continued contraction, after an estimated reduction of around 4% in seaborne volumes in 2025. Downwards longer term pressures on world coal consumption and international movements have been apparent for some time, so this is a largely foreseeable result.

Uncertainty surrounds the outlook for China's imports especially. Last year's Chinese buyers received 490mt (including overland volumes, but mainly seaborne), 52mt (10%) below the record high total in the previous year. Another sizeable decrease may occur, but there are many unclear features, including usage and stocks, output from domestic coal mines, and government policy for the domestic coal market.

Grain & soya

Positive influences in the global grain and soya trade segment are still apparently providing solid support. During the current 2025/26 trade year ending third quarter 2026, imports into Asia are expected to strengthen, accompanied by increased purchases by numerous other countries.

Updated forecasts published in mid-January by the US Department of Agriculture suggested that world trade in wheat, corn and other coarse grains, plus soyabeans and meal could expand by 33mt (5%) in 2025/26, reaching 727mt. This improvement could more than reverse the 22mt (3%) decline seen in the preceding 2024/25 year. An envisaged partial recovery in China's wheat, corn and barley imports after these plummeted in the past year is tentatively predicted. Other importers in Asia and the Middle East also are expected to purchase more grain.

Minor bulks

Trade in steel products (coil, plate, sheet and many other items), a major component of the minor bulks segment, evidently remained fairly flat last year. Total seaborne movements of around 400mt in the past twelve months are calculated, and some signs indicate a similar volume could be seen in 2026.

Bulk carrier fleet

New vessels entering the world fleet of bulk carriers contributed to an enlargement of cargo-carrying capacity in 2025. As shown by table 2, newbuildings of all sizes delivered last year totalled an estimated 36 million deadweight tonnes, about 6% above the previous year's figure. During 2026, orderbook schedules at shipbuilding years imply that a much large global increase is likely to be seen, perhaps expanding deliveries by as much as one-fifth.

TABLE 1: KEY ASIAN SEABORNE COKING COAL IMPORTERS (MILLION TONNES)

	2020	2021	2022	2023	2024	2025
Japan	49.7	52.1	51,3	49.8	46.0	43.0
South Korea	21.2	21.5	22.3	22.2	25.0	24.0
China	44.5	39.5	36.1	45.3	62.4	54.5
India	59.2	67.8	72.0	76.0	76.2	79.0
Total of above	**174.6**	**180.9**	**130.4**	**193.3**	**209.6**	**200.5**

source: various & BSA estimates

TABLE 2: BULK CARRIER NEWBUILDING DELIVERIES (MILLION DEADWEIGHT TONNES)

	2020	2021	2022	2023	2024	2025
Handysize (10-39,999dwt)	2.8	4.1	4.6	4.5	5.7	5.5
Handymax (40-69999dwt)	9.2	7.0	7.3	9.4	10.5	12.0
Panamax (69-99,999dwt))t	12.1	8.6	9.8	10.9	10.0	11.0
Capesize (100,000dwt and over)	25.1	19.0	10.3	10.7	7.7	7.5
Total	**49.2**	**38.7**	**32.0**	**35.5**	**33.9**	**36.0**
% change from previous year	18.0	–21.3	–17.3	10.9	–4.5	6.2

source: Clarksons Research & BSA estimates

by Richard Scott, Bulk Shipping Analysis, Tel: +44 (0)12 7722 5784; Fax: +44 (0)12 7722 5784; e-mail: bulkshipan@aol.com

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Global coal trade faces a squeezing

Coal loading using an E-Crane and a containerized bulk system from Container Rotation Systems.

Richard Scott, Bulk Shipping Analysis

After four years when growth persisted, global coal trade weakened last year, an expected outcome. Downwards pressures became more visible, a feature which seems likely to prevail in the year ahead as well as in the longer term future. Nevertheless there are doubts about year-to-year changes even if the direction of the trend seems fairly clear.

Estimates based on incomplete information and guesses for the remaining portion suggest that world seaborne trade in steam and coking coal was more than 50mt (million tonnes) lower in 2025, at about 1,330mt, compared with the preceding twelve months. Negative effects were concentrated in China but extended to several other Asian countries and Europe. Many suppliers to the world market experienced adverse effects, especially Indonesia and the United States.

Despite adverse influences becoming more prominent, last year's global coal trade performance demonstrated that international demand for imported coal is still supported by a number of market features. But the trend is likely to be affected in the years ahead by the priority in many countries attached to cutting carbon emissions, and shifting energy consumption towards cleaner energy sources. Coal consumption and trade is expected to reflect this setting.

Economic activity and energy

During the past twelve months the evolution of economic activity shaping energy use varied among coal consuming and importing countries. These underlying influences affected fuel usage patterns. According to International Monetary Fund calculations published last month, the broad indicator of gross domestic product (GDP) for the world economy as a whole grew by 3.3% in 2025, an unchanged pace from the previous year's 3.3% result. IMF analysts suggest that a similar growth rate could be seen in the current year also.

In the past year varying economic performances among individual countries continued to affect energy requirements. China avoided the slowdown envisaged by forecasters, maintaining its GDP growth at 5% even though domestic demand remained lackluster. In some other large energy-consuming countries, economic growth rates improved modestly, although not enough to have a large impact on energy markets. The European Union and Japan both saw limited pickups in GDP growth rates. India, by contrast, experienced accelerating strong economic expansion.

Over the period ahead in 2026 the potential for many countries to strengthen their performance seems likely to be constrained by headwinds including shifting policies on international trade. China's economy is forecast to experience difficulties in maintaining its progress at the rate seen in the past couple of years.

Broad patterns of economic activity are absorbed in energy demand, which also reflects specific influences amid changes among energy sources in individual countries. Energy is consumed in power generation, industrial activity and transportation, all of which are affected by the prevailing progress of economic activity. Direct consequences for coal usage and import demand may be limited because of the ongoing emphasis on boosting renewable energy supplies, particularly wind and solar, but also nuclear and hydro-power, enabling limitation of fossil fuel sources.

National and regional policies resulting from political decisions in numerous countries are likely to have an impact on overall consumption of energy, with implications for coal, in the year ahead and longer term. Amid the decarbonization imperative, an intensifying embrace of zero-carbon fuels and power sources, to counteract global warming, is having a profound effect. Government measures, especially among many of the largest coal importing countries, intended to limit and eventually eliminate carbon emissions while also cutting air pollution in urban areas, are having noticeable repercussions.

Another feature is the differing prospects for the two categories of coal trade. Coking coal, used in the steel industry is proving more difficult to substitute with other fuels, because of the nature of the steel manufacturing process, or because the duration of achieving substitution is extended over many years. Steam coal, the largest category, used mainly in power stations but also in cement works and other manufacturing industries, is the main focus of fuel switching, because there are alternative energy sources which are proving economically viable.

Trade trends evolving

Based on provisional calculations, last year saw a large reduction in world seaborne coal trade, following a period of four years, since 2020, when growth was brisk and in some years strong. In 2025 the biggest contributor to the global reduction was China's downturn, as shown in the table, accompanied by some declines elsewhere but offset partly by increases among smaller importing countries. Trade volumes declined in both the steam and coking coal segments, at similar percentage rates.

Trends among the largest importers and for world trade as a whole are shown in the table, using data compiled and calculated by Bulk Shipping Analysis. In 2024 world seaborne coal trade was 55mt or 4% above the previous year's level at 1,387mt, followed by an estimated matching fall of 55mt (4%) to 1,332mt in 2025. Tentative expectations for 2026 suggest another decline, perhaps in the 2–4% range, although this indication is somewhat speculative.

For comparison, a forecast using alternative data was published in late December by the Australian Government's Department of Industry, Science and Resources. A more limited reduction is suggested for the current year. Including all international coal trade movements, on overland as well as seaborne routes (the majority is seaborne), the total is shown as 1,412mt in 2026, a 2% decrease compared with the calculation for last year.

Within the overall 1,332mt seaborne coal trade estimated in 2025, coking coal, the smaller category of seaborne coal trade with about one-fifth of the total, was affected by lower import demand in China, Japan, Korea, Taiwan, and the European Union partly offset by a higher volume into India. In the dominant steam coal category, comprising the remaining four-fifths of trade, the downturn reflected a large fall in China and a lower volume into India, accompanied by mixed results in other countries.

Percentage changes shown in the table emphasize contrasting outcomes in the importing countries last year. Seaborne imports into China in 2025 were down by about 58mt or 14%, to around 360mt. Despite slower growth in supplies for the

WORLD COAL TRADE — PRINCIPAL IMPORTERS (MILLION TONNES)

	2020	2021	2022	2023	2024	2025*	% change**
China	238	281	234	359	421	363	–14
Japan	168	176	178	163	162	159	–2
India	227	204	244	263	254	250	–2
South Korea	117	119	120	115	111	107	–4
EU+UK	70	90	123	84	62	61	–2
other importers	362	359	336	348	377	392	+4
Total	**1,182**	**1,229**	**1,235**	**1,332**	**1,387**	**1,332**	**–4**

** Bulk Shipping Analysis 2025 estimate ** 2025 estimate compared with previous year*
source: Clarksons Research and Bulk Shipping Analysis, February 2026

Chinese market provided by domestic coal production, high stocks and subdued demand growth enabled foreign purchases to be cut.

In India imports appear to have seen a limited reduction in 2025, possibly of about 2% to about 250mt. Japan and Korea also appear to have seen decreases of 2% and 4% respectively, to estimated totals of 159mt and 107mt. Conversely, in the past twelve months steam coal purchases by a group of five smaller Asian importers — Malaysia, Pakistan, Philippines, Thailand and Vietnam — not shown separately, changed positively, evidently increasing by around 2% to reach over 160mt. This group has become a prominent trade segment amid rising power station capacity and continued electricity demand growth.

Seaborne imports into Europe appear to have stabilized last year after almost halving in the two previous years. The European Union and United Kingdom together are estimated to have seen a total of over 60mt in 2025, a similar volume to that seen in the preceding twelve months. Since the disruption of Europe's energy supplies occurring after natural gas pipeline imports from Russia were mostly ended in 2022, the energy market has become more abundantly supplied. The earlier downwards pressures on coal consumption and imports has resumed.

Among coal suppliers to the world market, numerous changes have been unfolding, affecting the geographical pattern of global coal trade. Some annual variations are already visible, although final 2025 figures are awaited. In the steam coal segment exports by Indonesia in particular, the largest supplier, are estimated to have fallen greatly, while lower exports by the USA and Colombia appear to have occurred. Coking coal exports from the USA and Australia evidently were lower.

Import demand hurdles

Weakness in global coal trade emerging last year tended to confirm expectations of a downwards longer-term trend starting, rather than being perceived as a temporary decrease in an otherwise buoyant underlying trend. Nevertheless it is not yet entirely clear whether progressive annual reductions will unfold consistently over the period ahead. Although indications suggest that a short term recovery is unlikely, it remains a possibility.

A common feature applicable to several major and some smaller coal importing countries is the difficulty of interpreting various signs. Future changes in influences determining the outcome — whether imports are up or down, and by how much, or unchanged — are surrounded by great uncertainties.

Annual forecasts are often informed guesses of what result may arise, and consequently are subject to continuous modification as more information emerges. The outlook for coal markets in some countries, including for domestic production (where relevant) is often unclear, sometimes because the effect of political influences is unpredictable.

Evaluating China's coal imports upsurge and then downturn in the past few years, and its implications for future volumes, is an especially prominent complication at the forefront of the current global outlook for coal trade during 2026 and later. China's import variations in recent years reflected several changing influences, some of which may evolve positively or negatively over the next twelve months. Expectations for changes in consumption, stocks and domestic coal output which could result in imports rising or falling are difficult to predict.

Attention is especially focused on China's purchases because these represented 25–30% of global coal trade in the past three years. Moreover in 2024 additional imports of 62mt into China contributed more than the net increase of 55mt in world seaborne coal trade. In 2025 the 58mt reduction in China's imports similarly exceeded the net reduction in the world total, emphasizing the significance.

Estimates of annual volumes moving into China tend to be guesses. While Chinese coal buying on international markets reflects commercial factors, short-term government policy decisions and influence often intervene, complicating analysis and intensifying doubts. General indications about these policies are known, or may be envisaged, but the timing and magnitude of effects on imports are much less predictable. Short-term trade flows may change rapidly.

Negative impulses pervading the international coal market and maintaining ongoing downwards pressure are evident in a broader perspective of factors affecting the longer-term trend of world seaborne coal trade. These influences severely constrain potential for coal trade to strengthen in 2026 or subsequently. National and regional policies on energy supplies, within which the broad strategy is visible but the timing and extent of specific measures is often less clear, are likely to reduce coal use and movements. The global impact of policy trends is set to drive a decline in coal trade over the decade ahead.

Measures introduced with the intention of benefiting the environment will continue to prioritize switching away from coal-fired power generation, towards cleaner natural gas or the frequently preferred choice of renewable energy supplies. In European countries especially, this emphasis has greatly reduced coal-fired power plant capacity and electricity generation and decimated the coal market.

Forecasts of world seaborne coal trade in 2026 incorporate speculation and guesses, as a result of these imponderables, albeit informed by perceptions about underlying trends and information emerging about actual changes occurring. Indications currently point towards weaker import demand in some countries during the next twelve months, which may be only partly offset by rises elsewhere.

Tentative predictions

Cautious views of prospects for coal trade this year have been expressed by several forecasters. Among these is the analysis already briefly mentioned, published recently by the Australian Government's Industry Department. This outlook points to a 2% decline in world coal trade during the current year, followed by a further small decrease next year. Some other forecasters suggest that a larger weakening could be seen.

One alternative arguably plausible estimate shows a 3–4% decline in world seaborne coal trade during 2026. Contributing a positive impulse, India's imports may be higher, perhaps by 4% rising to around 260mt, assisted by strengthening coking coal consumption amid rising steel output requiring high grade foreign supplies of coal. Also positively, steam coal imports by the group of smaller Asian buyers may sustain last year's 160mt total or see a rising trend continue.

A reduction of 5% or more in China's seaborne imports seems likely this year, based on evaluations of consumption, stocks and domestic coal output and availability. But the effects of changes in these components of China's vast internal market are not easily assessed. Prices for coal in the international market often have been influential as well. Energy security has become a greater priority and connected with this aspect, government policy changes could have a large impact on import flows.

Some signs point to continued reductions in Japan's and South Korea's imports, perhaps by 2–3% in 2026. Volumes received by European countries can be expected to be under sustained downwards pressure from the switch towards renewable energy sources, accompanied by further closures of coal-fired generation capacity, resulting in a possible further 10% coal imports decline. A large sub-group of 'other importers' around the world (excluding those outlined individually above), may experience a weakening pattern.

Trend reversal

Although global economic activity's support and composition, and its implications for energy demand are likely to be consequential, this influence is not likely to have the most visible impact on coal trade in 2026 and beyond. More prominently, coal's competitiveness with alternative energy supplies and, especially, pressure from decarbonization policies can be expected to prove crucial determining factors.

Last year seemed to mark the beginning of the widely expected longer-term weakening trend in world coal trade. But while the broad direction of the underlying trend seems fairly clear, year-to-year variations including in 2026 could be upwards or downwards. The pace of the envisaged slackening is also uncertain. Yet coal trade seems likely to remain a major international commodity market and a major element of global dry bulk trade for many years ahead.

In a report published at the end of last year, the International Energy Agency concluded that "coal imports are expected to see a sharp decline globally over the forecast period". IEA analysts observed that "China will ultimately shape the global trends. As it stands today, Chinese imports are forecast to decline by around 2.5% per year on average through 2030". An average annual decline in world coal trade of 2.3%, from 2024 to the end of the current decade, was estimated.

According to this prediction, global steam coal trade could experience an average 3.3% annual decline. A smaller 0.6% average reduction for coking coal trade was envisaged. Examining what the future impact on coal exporters might be over the next few years, the IEA commented that "as coal imports shrink and prices are pressured by cheaper and more abundant LNG (liquefied natural gas) supplies, the competition among exporters will intensify".

Despite overall negative expectations among observers about its future status, coal retains a central role in the world economy, as a significant contributor to energy supplies in power generation, steelmaking and some other manufacturing industries. In China, India and a number of emerging economies it is likely to continue to be viewed as a vital, dependable and economical source of energy, with widespread and reliable availability proving advantageous for energy security purposes. DCi

Oversupply remains the bane of the steel industry

The automated steel terminal at Peel Ports' steel facility at the Port of Liverpool, UK.

Kunal Bose

Supply surplus in the face of subdued global demand continues to keep steel prices low and eat into industry margins. The circumstances demand industry government cooperation for steelmakers' march towards carbon neutrality.

Chinese steelmakers once gain demonstrated a breathtaking agility in the year that recently closed with shipments of steel products to foreign destinations climbing to a record high of 119mt (million tonnes) from 110.72mt in 2024 in an environment of growing trade restrictions. But the steel industry in China, which has always enjoyed official patronage — covert and overt — faced with tough trade barriers in Europe, the US and India too, made spirited forays in the MENA (Middle East and North Africa) region. ASEAN, particularly the Philippines and Vietnam, retained its significance as a Chinese steel export destination.

But where does Beijing come in in Chinese steelmakers' major success in transitioning from developed markets to emerging economies as far as exports go? China's diplomatic outreach to countries in MENA region, the rest of Africa, Southeast Asian countries and South America and its Belt and Road policy had had a positive impact on the steel industry's attempt to build a large export market in emerging economies, as an alternative to the traditional developed countries which are all now given to protecting their own steel turf. Unarguably, more than any other politician/head of state, President Donald Trump was unabashed in putting stiff tariffs on steel imports to inject a new life to the US rust belt economy. He is having some success in reviving production and also getting foreign investment in steel — for instance, Nippon Steel's $14.9bn acquisition of the iconic US Steel at $14.9bn.

The Indian authorities, which have oversight of the domestic steel industry, will not have missed the point that from the time China engaged in building steel capacity at a never-before-seen speed, to the present restructuring of the steel leviathan, the government's supportive involvement is visible. The continuing restructuring relates to capacity elimination to fulfil two objectives: take out the technology-antiquated, high operating-cost polluting mills; and cut the industry size in a falling domestic demand situation. In spite of capacity reduction and a 4.4% fall in steel production to 960.81mt in 2025,

the lowest since 2018, the industry reeling under weak domestic demand from real estate and infrastructure sectors remained an aggressive exporter.

A raft of trade measures — including anti-dumping duties and staggered safeguard tariffs along with BIS certification requirements relating to quality — may have restrained imports from China, always a potential source of steel arrivals in India. (Indian trade measures, however, fall way short of similar actions by the US and the EU. The latter's Carbon Border Adjustment Mechanism [CBAM] is a major import disincentive.) What hurts India is steel prices staying low, largely because of the surge in seaborne trade in the commodity. According to some agencies, export shipments of steels and steel products globally might have risen as much as 6.9% to 279mt in 2025 from the year before. And the rise in global steel seaborne trade is almost entirely on account of China. Shipments from Japan, which is the world's second-largest steel exporter after China, recorded a fall in 2025. Similarly, flat global demand, tariff pressure and competition from China downed South Korean steel exports.

Based on the prices of HR coils and primary rebar in the third quarter of FY 2026, a marginal rise in coking coal cost and projections by leading fund managing firms, ET Intelligence Group has projected a 9–21% fall in EBITDA of Indian steel companies in December quarter. But this is what the Indian steel industry can ill afford. Adequate profitability will be the enabler for the steel industry to stay the course in capacity building for the country to reinforce infrastructure, close the deficit in housing and support manufacturing based on its own resources.

It speaks of the grit of the Indian industry that defying setbacks to profitability since FY 2023, caused by low domestic steel prices, it continued to pursue capacity expansion, including major investments in acquired assets. JSW Steel's acquisition of Bhusan Power and Steel and Tata Steel powering into Bhusan Steel, since renamed TS Meramandali, Usha Martin steel unit (since renamed TS Gamharia) and the government owned Neelachal Ispat underline the industry's faith in the industry's future, recent frustrations with prices, low profitability and imports notwithstanding.

All the taken over units had good assets, but they met with serious financial crises, principally because of management inefficiencies and reckless extravagance in the use of resources, financial or otherwise. The future holds so much promise for steel in India that ArcelorMittal-Nippon Steel joint venture acquired Essar Steel in 2019. Following this, the JV bought port and power assets of Essar in 2022.

If assured of the continued right kind of support of New Delhi as has been the case recently — without appearing to be protectionist — India will continue to stand out as the major exception to industry contraction or stagnation in China, Japan and elsewhere, mostly the developed West. Why India will stay as a notable exception among the 70 countries reporting their production and consumption to the World Steel Association will be clear from the 2025 global output tally. In the 2.2% retreat in world steel production to 1.8bn tonnes, the major contributors are China (–4.4%), Japan (–4%) and South Korea (–2.8%). In sharp contrast, Indian steelmakers lifted 2025 production by 10.4% to 164.9mt from 149.6mt in 2024 when output was up 6.3%. Furthermore, as opposed to shrinking demand in China, India stands out as an example of impressive rises in steel use in multiple sectors from construction to transport and energy transition. According to one agency, after growing at a CAGR of 6.4% over the past decade and a half, Indian steel use is likely to record a CAGR improvement of 7% through 2028 FY. Like the 2024-25 financial years, Indian steel consumption could record double-digit growth. Much will depend on the pace of government infrastructure spending and

capital expenditure by the private sector.

Hopefully, as all major integrated Indian steelmakers remained engaged in major capacity expansion, steel spreads should continue to improve following the required trade measures and the possibility of world iron ore prices remaining benign in the wake of supply improvement. This is particularly so with Guinea's Simandou mines, in which China is a major promoter. Trade officials are in consensus that the average ore price for the current year is $90–95 a tonne. The same, however, will not be the case with metallurgical coal, which may command relatively robust prices of up to $220 a tonne through this year, on robust demand from India and China restraining production of the fuel.

India has a target of building steel capacity of 300mt, production of 250mt and *per capita* use of 160kg by 2030–31. The important issue is not the achievability of the target in the next five years, the present capacity being around 210mt. What matters is that industry majors, including JSW Steel, Tata Steel, JSPL, SAIL and AMNS are all committed to grow capacity organically and also by way of takeovers if opportunities arise.

With steel being the highest emitter of carbon among all major industries, it is only natural discussions on restructuring of the ferrous metal will focus on steps to be taken to bring down the emission of greenhouse gases by a targeted year. China and India are not only the world's largest makers of steel, but their production is largely BF-BOF (blast furnace-basic oxygen furnace) based, by way of burning coal. In the case of China, around 85% of the industry's emissions originate from BF-BOF

Tata Steel CEO and managing director TV Narendran

operation. The pathways to cut carbon emissions are progressive transition to making steel through electric arc furnaces (EAFs), replace iron ore with scrap to the extent possible, switch from coal and gas to green hydrogen for iron ore reduction.

If Tata Steel is leading the charge in greening of the industry in India — the Group has a steelmaking presence in the Netherlands, the UK, besides India — aiming to become 'net zero' emissions by 2045, the Chinese industry, nudged by Beijing, is doggedly pursuing the target of peaking CO_2 emissions by 2030 and achieve carbon neutrality by 2060. China is going about the job by aggressively promoting EAF capacity building, raising scrap usage, increasing the share of renewable energy in the power mix and adopting hydrogen-based metallurgy. In the pursuit of controlling environmental damage caused by the Chinese industry, what also will be a contributing factor is the continuing domestic production and demand fall of the metal.

What Tata Steel is doing in India, where all its capacity is mounted on BF-BOF and also in Europe could become the prototype for industry constituents across the world pursuing carbon-free operation. At Port Talbot in the UK, the Group — after pulling down an end-of-life BF and coke oven plants — is building a 3.2mt EAF. The transition to decarbonization of steelmaking is being supported by the UK government funding of 500 million sterling pound. Once the EAF, scheduled to be commissioned in 2027–28, starts operating at optimal level, the annual reduction in direct CO_2 emissions will be 5mt. In the Netherlands, the Group is hopeful of concluding a deal with the Dutch government for transitioning out of one of the two BFs to gas-based DRI (direct reduced iron)-EAF steelmaking. In the steel industry's transition to minimal carbon emitting, the government-industry partnership is essential, including the former providing financial and policy support.

Among the early promoters of circularity in the industry by laying stress on generation and collection of scrap and then process them into steel, Tata Steel CEO and managing director TVS Narendran is leading the company to build a 0.75mt scrap-based EAF in Punjab. Obviously, besides the cause of circularity and staunching emissions, Narendran's objective is to meet the location specific demand economizing on logistics costs and promoting supply efficiency. It will not come as a surprise if Tata Steel in future remains engaged in constructing EAFs in other regions of the vast country that is India. The company is to pursue a 3mt steel recycling business in the country by 2030. Tata Steel owns three EAF based units in Thailand with combined crude steel capacity of 1.7mt. DCi

Steelpaint coats fourth Xiamen Minhua newbuild as 'Min Hua 17' approaches delivery

German company Steelpaint has successfully completed the application of a Stelpant corrosion-protection system to *Min Hua 17*, the latest in a series of newbuilding's scheduled to enter service after the Lunar New Year.

The 12,000dwt multi-purpose cargo ship, the fourth vessel in the Xiamen Minhua Shipping fleet to use the polyurethane based zinc-rich primer, follows similar applications to *Min Hua 9*, *Min Hua 15* and *Min Hua 16*. The Fujian Donghai Shipyard built all four vessels.

However, following the success of the first coating in the cargo holds of the 2024-delivered *Min Hua 9*, the ship manager expanded the scope on subsequent ships to protect cargo holds, hatch covers and the main deck.

"When we first specified Steelpaint, we wanted to see how the coating would behave in service," said Li Jianbin, General Manager of Xiamen Minhua Shipping. "What we observed was that the zinc primer remains intact when the topcoat is mechanically damaged, protecting the substrate from corrosion. The crew is better managing coating upkeep without repeated full-area touch-ups, which has reduced maintenance costs by about 50% compared to other types of coatings."

Operational feedback was also gathered from an inspection of *Min Hua 15* after one year of service carrying coal, general stores and containers.

Li Yinlong, head of Steelpaint's operation in China, who attended the inspection, said the assessment reflected the crew's direct experience.

"The vessel had been operating normally throughout the year," he said. "When we inspected the coating during a scheduled port stay at in Lianyungang, the chief officer said he was satisfied with its condition. He also said routine maintenance work had been reduced and that repeated purchases of paint for touch-up work were no longer required."

Min Hua *16 launch.*

All four vessels in the series now have tank tops and lower stools/hoppers protected by two 80µm coats of Stelpant-PU-Zinc primer, followed by a 120µm application of a conventional topcoat epoxy. Other areas required only a single Stelpant primer coat.

With its high-solid formulation and finely meshed zinc pigments Stelpant-PU-Zinc can be applied in temperatures ranging from –5°C to +50°C, and with a relative humidity level as high as 98%.

Steelpaint Director Frank Müller said the project demonstrates how coating performance translates into specification decisions.

"In real trading conditions is exactly how coating performance should be evaluated," he said. "The fact that each successive vessel has expanded the protected areas shows that the owner can see and quantify the benefit. For multi-purpose vessels, where coating damage is unavoidable, retaining primer integrity is critical to vessel safety and lifespan."

Xiamen Minhua Shipping has confirmed that Stelpant will also be applied to a new series of 12,000 and 17,000dwt multi-purpose cargo newbuildings.

Two other Chinese bulk carrier operators are currently trialling the corrosion protection system.

About Steelpaint GmbH

For more than 40 years, Steelpaint has enhanced the life and durability of heavy-industry facilities, particularly in the maritime sectors. Thanks to one-component polyurethane resins, the Germany-headquartered company's special high-tech coatings have raised the technological bar in corrosion resistance, offering impressive benefits over conventional epoxy coatings solutions.

Steelpaint has origins dating back to the 1890s. Its products are used widely in port and offshore facilities, sheet pilings, internal and external linings, tanks, bridges, and ship structures. They can be used in combination with cathodic protection.

Applying Stelpant to the fabricated steel during the Min Hua 16 *building phase.*

Anemoi calls for greater alignment in wind propulsion performance verification in new technical paper

Anemoi Marine Technologies Ltd (Anemoi) and Lloyd's Register (LR) have published a new paper encouraging closer alignment between existing methodologies used to verify the performance of wind-assisted propulsion systems (WAPS). The research highlights how complementary frameworks can be brought together to strengthen consistency, transparency and industry confidence.

The paper builds on LR's earlier verification of Anemoi's new in-service performance and forecasting model calibration methodology, designed specifically for WAPS. The new research assesses how that method fits alongside two existing frameworks: the International Towing Tank Conference's (ITTC) guidelines for sea trials and supporting performance prediction and DNV's recommended practice for in-service testing.

Currently WAPS users and providers are applying a range of different approaches to performance analysis, making it difficult to compare results like-for-like and build a robust business case for decision makers to commit to WAPS installation on their vessels.

The analysis shows that the three methodologies are complementary. While ITTC guidelines provide a short-term verification of predictions under controlled conditions and DNV's recommended practice offers long-term in-service assessment, Anemoi's verification method provides the bridge between in-service measurements and actionable fuel-saving predictions.

The findings suggest that by selectively combining these strengths, an integrated and standardised approach would give ship operators' an invaluable tool for maximising the cost-saving potential of WAPS installations. This work would simplify comparison between solutions and strengthen confidence in reported savings at a time when more and more vessel operators are considering wind propulsion technologies.

Anemoi's process, verified by LR in 2025, involves measuring vessel data when the wind-assisted propulsion system is turned on and off while encountering various conditions during regular operation. The data is then used to calibrate predictions on forces generated by the rotor sail system and their impact on the vessel, which can be used to predict voyage fuel savings with high levels of confidence. The process is technology agnostic and can be applied on all vessel types.

The new paper was presented at the Royal Institute of Naval Architects' RINA Wind Propulsion 2026 conference on February 17.

"Accurate measurement and prediction of the real savings made by vessels using WAPS is essential for giving confidence to ship owners and operators who want to harness wind energy in order to reduce environmental impact and fuel costs. With our verification process and our new efforts pointing to the potential convergence of methodologies, Anemoi is helping to guide the standardization efforts that are needed to ensure this market flourishes," said Luke McEwen, Technical Director, Anemoi Marine Technologies Ltd.

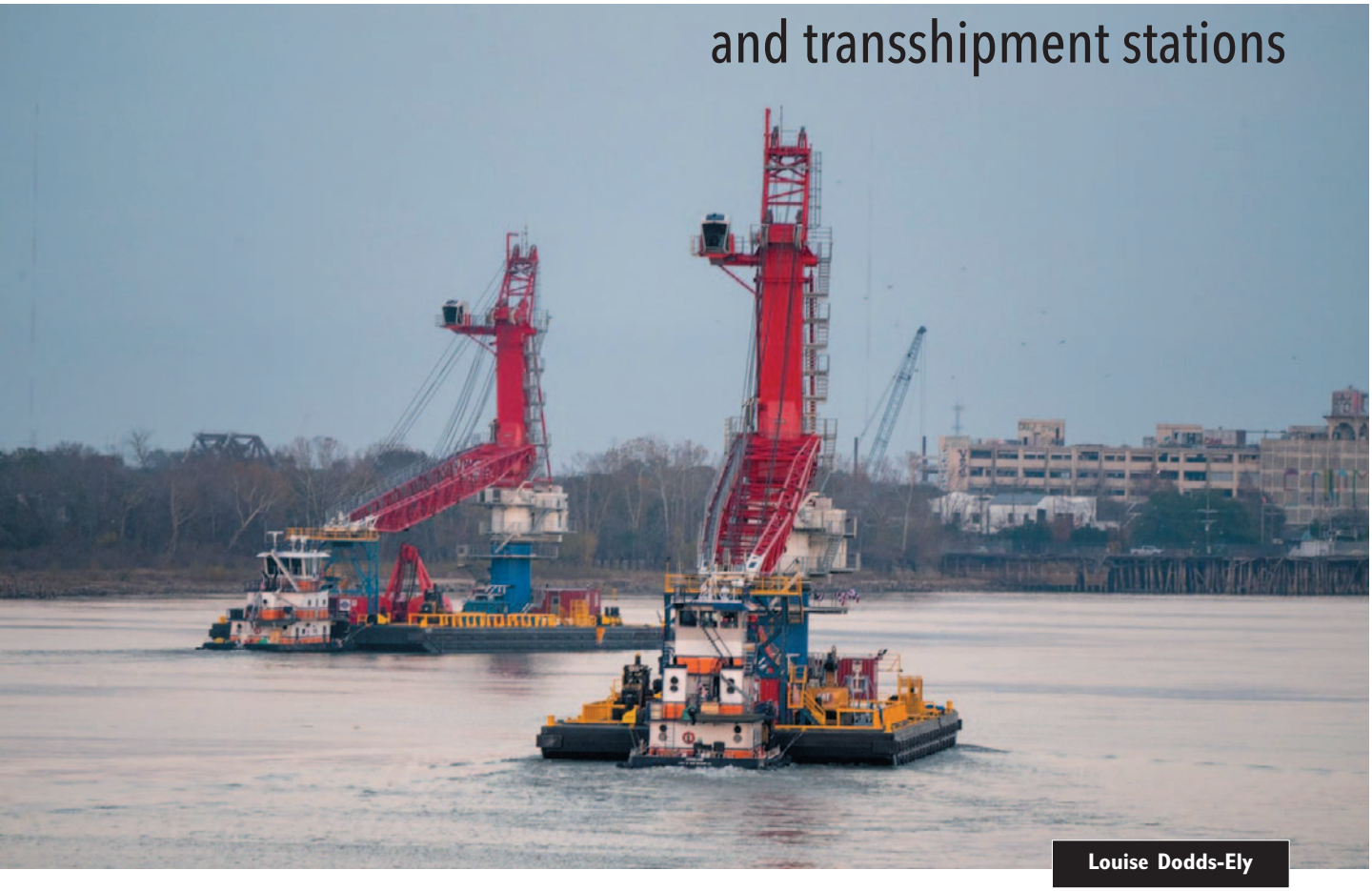
"Verification of performance assessment methodologies is a core part of LR's mission to assure both safety and efficiency standards for maritime stakeholders — and particularly important in emerging sectors where processes have yet to be fully standardized. We are therefore delighted to partner with Anemoi once more to advance understanding of performance verification as the WAPS market matures," said Dr Santiago Suarez de la Fuente, Ship Performance Manager, Lloyd's Register Advisory.

About Anemoi Marine Technologies

Incorporated in 2015, Anemoi Marine Technologies Ltd is a UK-based engineering R&D company that designs and installs Flettner Rotor Sails on large commercial vessels. Its cutting-edge Rotor Sail technology harnesses the power of wind, one of the world's most abundant renewable energy sources, to reduce fuel consumption and emissions, supporting global shipping to become cleaner and more efficient. Anemoi typically installs between three and five Rotor Sails, up to 35 metres in height, on each vessel, with each Rotor Sail saving approximately one tonne of fuel per day and around three tonnes of CO_2 emissions.

Offshore, midstream and self-handling

with geared bulkers, floating cranes and transshipment stations



Louise Dodds-Ely

Associated Terminals christens two Liebherr CBG 500 E Cranes on the Mississippi River

The 'D. Lopez' and 'Bill S.' mark a milestone in modern river cargo operations

In late January, Associated Terminals christened two new Liebherr CBG 500 E cranes — the *D. Lopez* and the *Bill S.* — during a ceremony held along the Mississippi River at Woldenberg Park in New Orleans. Set against the New Orleans riverfront, the ceremony welcomed industry leaders and maritime stakeholders to mark a defining investment in the future of cargo movement on the Lower Mississippi River.

Mounted on newly designed crane barges purpose-built for efficiency, longevity, and performance, the cranes are engineered to support high-capacity bulk cargo operations in demanding inland river conditions. Each crane is engineered for high-volume bulk handling, offering maximum grab capacities of up to 90 tonnes. Integrated LiCAtronic energy recovery systems enhance efficiency by capturing braking and lowering energy, while remote diagnostics and ergonomically designed operator cabins support safe, reliable, and continuous operations.

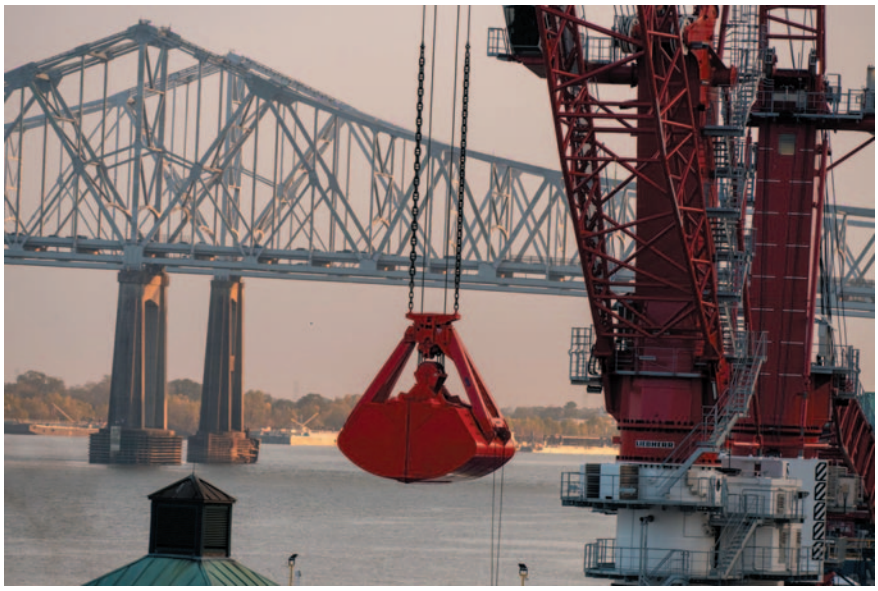
The two CBG 500 E cranes are installed on Associated Terminals' next-generation crane barges, constructed at LAD Services and designed to set new standards in efficiency and sustainability. The barges incorporate hybrid-ready power systems provided by Caterpillar and Louisiana CAT coupled with intelligent load management to optimize engine runtime and reduce fuel consumption, and keel-cooling technology that minimizes maintenance demands while reducing environmental impact. The cranes were assembled and integrated on the crane barge at Boh Bros.

"The christening of the *D. Lopez* and the *Bill S.* represents far more than the addition of new equipment," said Todd Fuller, President of Associated Terminals. "It reflects how we lead this company — by investing deliberately, planning for the long

term, and setting a high standard for how cargo moves on the river. These cranes strengthen our capabilities today while reinforcing our responsibility to operate safely, efficiently, and with purpose for decades to come."

"Investments like the *D. Lopez* and the *Bill S.* are about readiness and evolution," said Gary Poirrier, Chairman of Associated Terminals. "By modernizing our river infrastructure with advanced crane and barge systems, we're building smarter, more enduring operations and positioning the Mississippi River to meet the next generation of cargo demand while remaining a competitive gateway for global trade."

"The christening reflects what can be achieved through collaboration and forward thinking," said Gregor Hillen, Sales Manager for Port- and Transshipment Solutions at Liebherr-Rostock GmbH. "We are proud to stand alongside Associated Terminals in shaping the future of river cargo handling."



Honouring the people of Associated Terminals

In keeping with company tradition, Associated Terminals named the cranes in honour of individuals whose leadership and dedication have helped shape the organization.

The *Bill S.* is named for Bill Sullivan, Vice President of Sales. Sullivan joined Associated Terminals in 2001 and has played a central role in building customer relationships and supporting the company's growth across the Lower Mississippi River.

"I'm truly humbled by this honour," Sullivan said. "This company has always placed the highest value on the people doing the work every day. Having my name on one of these cranes is a reminder that success on the river is built by teams working together with pride and professionalism."

The *D. Lopez* is named for Dawn Lopez, Vice President of Marketing and Public Relations for Associated Terminals and Turn Services.

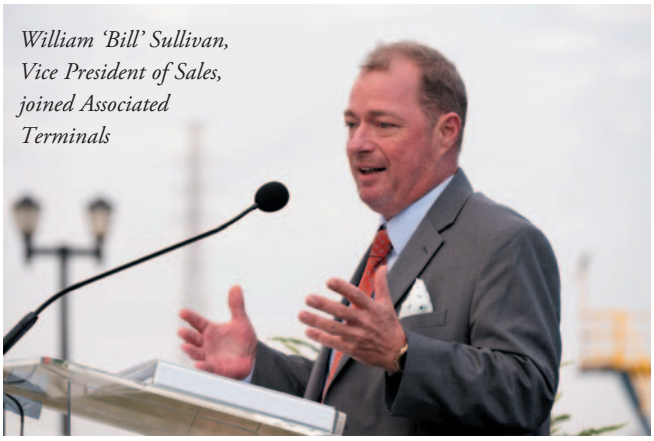
"This crane represents generations of people who have built and sustained this work on the river," Lopez said. "It reflects the leadership, discipline, and pride of the teams who plan the work and move cargo safely every day. I'm proud to be part of a company that invests in enduring operations by honouring its people and holding itself to a consistent, high standard — today and for those who come next."

As the *D. Lopez* and the *Bill S.* officially entered service, the ceremony marked a defining milestone in Associated Terminals' continued investment in modern, enduring river infrastructure.

About Bill Sullivan

William 'Bill' Sullivan, Vice President of Sales, joined Associated Terminals in 2001 and quickly rose through the ranks. A

Dawn Lopez, Vice President of Marketing and Public Relations for Associated Terminals and Turn Services.



William 'Bill' Sullivan, Vice President of Sales, joined Associated Terminals

native of Lexington, Kentucky and raised in Lincoln, Nebraska, Bill attended the University of Nebraska – Lincoln, but compelled by a sense of duty, enlisted in the US Navy as an Aviation Ordnanceman prior to the commencement of Operation Desert Storm in 1991. Known for his deep respect for field teams, he's often quoted as saying, "Sales may get us the opportunity, but it's your hard work and professionalism that brings return business."

About Dawn Lopez

Dawn Lopez, Vice President of Marketing and Public Relations for Associated Terminals and Turn Services, joined the company in 2012. A Louisiana native and LSU Law graduate, she has led strategic communications efforts that spotlight the company's growth, partnerships, and people. Known for her advocacy of the maritime workforce and involvement in regional economic development, Dawn is dedicated to telling the stories of the Associated Terminals and Turn Services team members — celebrating their contributions and strengthening the company's presence in the communities it serves.

About Associated Terminals

Associated Terminals is a prominent stevedoring and marine logistics company serving the Lower Mississippi River and beyond. Founded in 1990 and headquartered in Convent, Louisiana, the company provides cargo handling, midstream and dockside crane operations, and terminal services supporting global trade. Associated Terminals is committed to safety, operational excellence, and continued investment in equipment and infrastructure that strengthens the river economy and the communities it serves.

Nibulon's expertise includes offshore and transshipment operations

The 140m NIBULON MAX, *with two Liebherr cranes, can handle up to 18,000 metric tonnes/day. It is the largest self-propelled floating crane in Ukraine.*

Company background

Nibulon is one of Ukraine's leading agricultural exporters and logistics companies, with its own shipbuilding yard and full-cycle river logistics infrastructure. Before the war, the company carried out the majority of its exports through its own deep-sea terminal in Mykolaiv on the Southern Buh River, which served as a key hub for international shipments. The company's shipping division was established in 2009 as part of a national initiative to revive inland water transport, primarily to provide Ukrainian farmers with an affordable and environmentally friendly logistics solution.

Since then, Nibulon has built a vertically integrated system that includes a modern fleet (most of it self-built), a shipbuilding and repair yard in Mykolaiv, and a network of terminals along the Dnipro and Southern Buh rivers, and — since 2022 — the Danube. Today, Nibulon operates a fleet of 83 vessels, making it one of the youngest and most modern river fleets in Europe.

Fleet and transshipment capabilities

Non-self-propelled barges

- **NBL-90:** 22 units, dwt 4,200 metric tonnes;
- **NBL-91:** six 6 units, dwt 3,000 metric tonnes;
- **B2000:** eight units, dwt 2,000 metric tonnes;
- **B1500 (open deck):** four units, dwt 1,500 metric tonnes; and
- **B5000M:** two units, dwt 5,000 metric tonnes.

Towboats

- **POSS-115:** ten units, 2,560hp;
- **Project 121:** three units, 1,200hp;
- **Project 121-M:** four units, 1,200hp;
- **Project T-3500:** two units, 3,500hp; and
- **Project 410:** two units, 500hp.

Floating cranes

- **'NIBULON MAX' (140m), with two Liebherr cranes:** handles up to 18,000 metric tonnes/day;
- **'St. Nicholas', also with Liebherr crane:** up to 10,000 metric tonnes/day; and
- **'Nibulonivets'** and **'Nibulonivets-2'**: non-self-propelled vessels for the transshipment of bulk and general cargoes.

Special-purpose vessels

- Dredgers, pontoons, passenger vessels, and support craft.

Most of Nibulon's vessels are of river-sea class and adapted for operations under complex navigational conditions, including ice seasons and mixed inland/coastal routes.

NBL-91 non-self-propelled barge.

Commodities handled

Nibulon's equipment is suited for handling a wide variety of bulk and break-bulk cargo, including:

- grain (wheat, corn, barley);
- oilseeds;
- fertilizers;
- steel and metal products;
- construction materials; and
- fruits, vegetables, and general cargo.

Offshore & river transshipment

Nibulon has extensive experience in both inland and offshore (roadstead) transshipment. Its floating cranes and barge-tow systems allow Nibulon to flexibly transfer cargo between rivers and seagoing vessels, especially where port infrastructure is under strain.

Expansion to the Middle and Upper Danube

Russia's full-scale invasion disrupted many of Ukraine's key transport corridors, including river ports like Mykolaiv. In response, Nibulon built a new terminal on the Danube and partially relocated its fleet to Izmail.

Initially, this capacity was used for the company's own grain exports via Constanta. However, in 2024, Nibulon expanded further upstream, entering the Middle and Upper Danube region. Today, Nibulon offers full logistics services for regional partners including agri-traders and industrial cargo owners — operating with nine towboats and 11 barges in this area, with total capacity of approx. 37,000dwt.

This move not only strengthened Nibulon's export position but also contributes to a more competitive and diversified logistics environment across the Danube corridor.

The St. Nicholas *floating crane can handle cargo at up to 10,000 metric tonnes/day.*

Staying competitive

Nibulon's competitive advantages include:

- continuous investment in shipbuilding and fleet renewal;
- versatility in cargo types and vessel combinations;
- route and delivery flexibility;
- real-time digital cargo tracking; and
- deep international expertise and reputation for reliability.

Erik Thun Group at a glance

Erik Thun Group is a Swedish, family-owned shipping company founded in 1938 and headquartered in Lidköping. It operates a modern short-sea fleet across Northern Europe in three core business areas: dry cargo (including self-unloaders); product tankers; and cement carriers (through its JV JT Cement). Erik Thun's philosophy is long-term, responsible, and customer-driven — building purpose-built ships and improving each new generation to be more efficient, safer, and quieter with a steadily lower environmental footprint.

JT Cement — specialized pneumatic cement logistics in Northern Europe

Structure & footprint: JT Cement (JTC) is a 50/50 joint venture between Erik Thun Group and NovaAlgoma Cement Carriers (NACC). Based in Bergen, Norway, the company focuses on smaller cement carriers (≤ ~8,000 dwt) trading primarily in Northern Europe on long-term contracts with major cement producers.

Fleet: JTC operates eight modern, specialized pneumatic cement carriers of 8,000dwt or less. Three sister ships are LNG dual-fuel newbuilds delivered in 2015, 2016, and 2019 from Ferus Smit (the first 'green' cement carriers of their class due to natural-gas propulsion and optimized hulls). The fleet is designed for dust-free, fully enclosed, weather-independent loading/unloading with no need for shore-based assistance.

Cargo handling & equipment: JTC's vessels use pneumatic systems with compressors, pumps and blow-tanks to move fine bulk cargoes; cement, fly ash and GGBFS through enclosed pipelines from ship to silo or shore reception. The system minimizes spillage and emissions and can operate continuously regardless of weather, which makes the vessels attractive for transloading and calls at ports without specialized infrastructure.

Where JTC competes. Northern Europe's cement supply chains demand high

schedule reliability, cleanliness, and precision discharge into silo infrastructure in constrained, weather-impacted ports. JTC's specialization (small-to-mid dwt, ice-class capability on several units, and dual-fuel LNG for part of the fleet) aligns with those constraints. The JV's portfolio approach (with NACC's global pneumatic expertise) lets the team keep focus on regional optimization while leveraging broader technical and commercial know-how.

Thun Self-Unloaders — flexible belt-ship solutions for bulk trades

Scope & sizes: Thun Self-Unloaders is a business within Erik Thun Group that charters and operates self-discharging bulkers in the ~5,800–10,500dwt range — optimized for Northern Europe but capable of broader trading. The self-discharging capability enables efficient calls at ports with limited bulk-handling infrastructure and supports weather-independent operations.

How the system works: Erik Thun's ships employ the Thun Cargo Scooper system (scraper-conveyors in box-shaped holds) that feed cargo to a longitudinal belt, then to a bucket elevator, and finally along a slewing boom conveyor to quay hoppers, stockpiles, or trucks. On certain vessels, a dedicated cement screw and pneumatic option allow discharge directly to trucks or to silos for powder cargo. All equipment is enclosed to minimize dust and spillage.

Unloading performance & outreach.

Belt-boom discharge (aggregates, minerals, biomass, etc.): typical continuous rates about 350–500tph (metric tonnes per hour), with boom outreach ~14.5–25m depending on class and loading condition (examples below).

Cement discharge (when fitted): typical rates ~180tph pneumatic to silo and ~120tph mechanical screw to trucks, enabling dust-free, continuous operations and fast truck turnarounds.

Representative vessel particulars (examples)

- *Östanhav* (Finnish/Swedish Ice Class 1B): belt self-unloader with ~350tph discharge rate and ~14–15m outreach; twin box holds total ~5,465m³.
- *Kalkvik* (Ice Class 1A): belt self-unloader with ~500tph discharge rate; boom outreach up to ~25m; twin holds total ~9,220m³ (~9,000 tonnes typical cargo intake).
- *Mornes* (Ferus Smit): belt system plus pneumatic/screw equipment for cement — ~180tph to silo and ~120tph to trucks.

Commodity flexibility: the self-unloaders carry a wide range of dry bulks, including limestone, quicklime, aggregates, fertilizers, biomass/wood pellets, grains, and industrial concentrates; when equipped, they also perform cement truck or silo operations. The box-shaped holds and retractable gear support quick loading by grab or chute, and the enclosed system keeps quays clean while lowering dust and noise — an important point for urban terminals.

Typical unloading scenario: for stockpile deliveries, the vessel brings the boom athwartships to reach either a quay-mounted hopper or a designated laydown, adjusting the discharge rate to match the terminal's reception capacity. For cement operations, a parallel arrangement with silos or — where no silos exist — two trucks in continuous rotation reduces waiting times and keeps berth occupancy down.

Why self-unloaders (and small pneumatic carriers) expand port optionality

For receivers without heavy fixed infrastructure — or where berths face weather downtime — self-unloaders and pneumatic cement carriers deliver a controlled, enclosed, and independent cargo flow. The result: less waiting time, fewer third-party interfaces, lower clean-up costs, and consistent operations at smaller or draught-restricted ports. In practice, that opens up more terminals and supports transloading strategies, especially in Northern Europe's tight logistics networks.

Staying competitive: practical sustainability and ship design

Erik Thun's approach is to invest in practical sustainability — solutions that cut fuel and noise, increase cargo per call and keep crews and neighbors safer.

Hybridization & shore power (dry cargo newbuilds): in Erik Thun's broader dry cargo segment (separate from self-unloaders but part of the same technical programme), the new Lake Vänern MAX series integrates battery packs for peak-shaving and power smoothing, optimized propulsion (large-diameter propeller in nozzle), and shore-power readiness for silent, zero-emission port stays. The design maximizes cargo within strict Vänern canal/lock dimensions and Ice Class 1B requirements.

Continuous fleet renewal: the Lake Vänern MAX programme delivered its first units in 2024 and culminated with the launch of *Naven* (sixth and final in the series) in December 2025 — Erik Thun's 50th vessel built with Ferus Smit and MF Shipping Group. The same in-house design principles (cargo maximization, lower resistance, electrical efficiency) inform the company's self-unloader and cement programs.

LNG dual-fuel in cement trades: JTC's LNG triad demonstrates measurable reductions in local emissions versus conventional marine fuels while maintaining the dust-free pneumatic handling that cement receivers require.

Recent milestones and context

Corporate: Erik Thun Group today runs ~50 vessels across dry cargo, tankers, and cement carriers, with an active renewal programme in both tankers (methanol-ready 'R-class') and dry cargo. This scale and design cadence help the company keep operating costs competitive while meeting customer decarbonization goals.

Dry cargo innovation: the Lake Vänern MAX series (hybrid, shore-power ready, optimized hull and propulsion) is a practical example of Erik Thun's 'resource efficiency' focus migrating into everyday trades.

Self-unloader performance: across the class, belt-boom rates typically range ~350–500tph with outreach up to ~25m, and cement-equipped units routinely discharge ~120–180tph depending on whether the delivery point is silo or trucks.

JT Cement positioning: the JV remains a specialist in Northern Europe, leveraging pneumatic technology (and LNG on three sister ships) to serve major cement producers on long-term contracts.

Company background & tone of work

Erik Thun Group is a third-generation family business. In practice, that translates into long-term partnerships, a focus on reliable, efficient tonnage, and an engineering-led culture where it iterates every new vessel class. For receivers and cargo owners, the company's value is practical: short-sea logistics that work in real ports, real weather, and real budget frameworks with measurable improvements in energy use and cargo-per-call over time.

Quick reference: fleet & capability summary (selected data points)

- JT Cement (JV of Erik Thun & NACC, HQ Bergen): eight pneumatic cement carriers (≤8,000 dwt), three LNG dual-fuel sisters (delivered 2015/2016/2019); enclosed, dust-free, weather-independent cargo handling; focus on Northern Europe.
- Thun Self-Unloaders (Erik Thun Group): fleet in the ~5,800–10,500dwt range; Thun Cargo Scooper belt-system with slewing boom; typical belt discharge ~350–500tph and outreach up to ~25m; optional cement-handling (~120–180tph to trucks/silos). Commodities include limestone, quicklime, aggregates, fertilizers, grains, wood pellets, and industrial concentrates.

Royal Bodewes: high-tech vessels with a strong focus on the environment

Royal Bodewes is a highly respected shipyard that specializes in new-build short-sea shipping cargo vessels. Its USP is its ability to create a cargo hold that is as big as possible in the most efficient hull possible. By doing so, it can ensure that the required propulsion power will be as low as possible so that emissions will be lower. The company is always on the lookout for alternative fuels and other propulsion systems.

To date, Royal Bodewes has delivered ten self-discharging cement carriers to Eureka Shipping in Norway. It has also delivered one ship to U-Ming from Taiwan.

In the near future, Royal Bodewes will embark upon the development and building of the next generation self-discharging cement carriers. These vessels — with and without ice class — will have a diesel/electric propulsion system so that the power train on board either can be used for propulsion or for cargo handling of the systems on board. Due to international environmental legislations, it is ever more important to reduce emissions. These new vessels will be designed to be as ready as possible for new future fuels. In case a new fuel will be introduced, the generator sets can be changed or adapted to these new specified fuel. Also, major shore power connections will be optional, so that the cargo handling energy consumption can be taken from shore.

In line with its focus on safeguarding the environment, Royal Bodewes will deliver a zero-emission cargo vessel to K. Sætre Rederi — and it seems likely that the first fully electric self-discharging vessel will not be far behind.

Artist's impression of the Zero Emission Vessel which is set to be delivered to K. Sætre Rederi in March 2028.

Royal Bodewes to build zero-emission cargo vessel for K. Sætre Rederi

K. Sætre Rederi has ordered a full electric, zero-emission cargo vessel from Royal Bodewes. Delivery is scheduled for March 2028. This innovative RB 3600 Zero-Emission Vessel marks a significant step towards sustainable shipping and maximum operational efficiency. Specifically designed to meet the logistical needs of K. Sætre Rederi, the vessel will operate along Norway's coastal route, transporting products for the steel producer 7 Steel Nordic from Mo i Rana.

With its length of 70 metres and a deadweight of approximately 3,600 tonnes, the vessel will feature an impressive 13.3MWh battery system, providing an endurance range of more than 270 nautical miles, setting a new benchmark for electric cargo ships in this segment. Electrical integration will be delivered by SEAM, headquartered in Haugesund, Norway. The vessel will sail under the Norwegian flag and comply with Norwegian crew terms and conditions.

"This represents a major technological breakthrough for coastal shipping. With this electric range, we can operate large parts of the Norwegian coastline fully electric without emissions, largely relying on existing charging infrastructure," says Åge Sætre of K. Sætre Rederi.

Innovation at its core

The innovation power of several renowned suppliers and leading knowledge institutes will bring the RB 3600 zero emission vessel to life. In the coming months, development will continue to ensure the vessel reaches its full potential.

Electrifying ships is far more than simply replacing the main engine; it's a complete transformation of maritime technology. It is all about efficiency and saving energy.

The advanced hull design and hydrodynamics will lead to minimum resistance. Smart energy management systems for optimal battery performance, in combination with a high-efficiency propeller design, will reduce energy consumption and enlarge the endurance of the vessel sailing on batteries.

These measures ensure that the RB 3600 Zero-Emission Vessel will not only sail emission-free but also set a new standard for operational efficiency in coastal shipping.

About Royal Bodewes

Royal Bodewes, is a family-owned major shipyard in the Netherlands with more than 200 years of experience in shipbuilding.

The yard is specialized in designing and building high quality, innovative vessels with a focus on efficiency and sustainability. The portfolio of the yard is endless. With dry cargo vessels, self-discharging cement carriers and specials, like tankers and ro-ro, the list of vessels built is extensive.

Royal Bodewes is building at three yards simultaneously all in the north of the Netherlands. The current orderbook includes all various vessel designs with different innovative propulsion systems (hybrid, diesel-electric, methanol ready, biofuel) to meet the sustainable goals of the future.

About K. Sætre Rederi

K. Sætre Rederi is a family-owned company based in Austrheim, Norway. The company has over 100 years of experience with transporting cargo, focusing on the transport of bulk commodities and general cargo on the North Sea. Today the company owns and operates four vessels, ranging from 1,500 to 4,800dwt.

Royal Bodewes moves towards zero energy with 'hybrid' self-dischargers that minimize energy consumption and emissions

Self-dischargers for Aasen Shipping

Shipping is on the eve of an energy transition. The goal is clear: to move from fossil fuels to zero carbon energy sources and technologies. Royal Bodewes is proudly joining this transition; on 12 March this year, the company will launch the fifth in a series of 9,400dwt vessels — the *Aasvard.* All units have been built for built for Norwegian Shipping Company Aasen Shipping.

The five 9,400dwat [deadweight all-told] general cargo hybrid self-dischargers are:

- the *Aasfjell*, which has the distinction of being the world's first newly built hybrid self-discharger — this unit completed sea trials on 15 December 2021;
- the second unit, the *Aasfoss*, which was delivered in 2022;
- the third unit, the *Aasvaer;*
- the fourth unit, the *Aasland;* and
- the fifth unit, the *Aasvard,* which will be launched on 12 March this year.

The construction of all five vessels emphasized zero emissions at harbour and substantial reduction of emissions during sailing.

Battery pack for peak shaving

Unique to these vessels is their hybrid

nature. Next to the MGO main engine, they have an electric motor and tonnes of batteries. The 620kWh battery pack on board enable peakshaving and emission-free sailing and port operations. The battery pack on all of the vessels in the series offers another advantage; it is used for peak shaving during sea voyages. Whenever the engine needs more power in heavy seas, the batteries boost the propeller and whenever an overload of energy on the main engine is measured, the batteries absorb the energy. This way, the engine is more stable and more fuel efficient. It also has a positive impact on emissions. The system satisfies IMO TIER III requirements.

Benefits and features of the Bodewes hybrid bulk carrier 9400dwat:

- battery package enabling reduced fuel consumption of about 400t per year;
- battery package enabling peak shaving on main engine reducing emissions and fuel consumption;
- battery package enabling propulsion and manoeuvring in port without use of main engine;
- electric excavator — nearly noise-free loading and discharging operations;
- combination of electric excavator, battery & connection to shore grid for emission-free operations in port;
- variable revolution on main engine reducing consumption/emissions further during slow steaming;
- active eco-control of propeller and main engine enable the most optimized operation; and
- optimized hull design and main engine focusing on reduced emissions and fuel consumption.

About Aasen Shipping

Aasen Shipping was established in 1981 by Hans Martin Torkelsen. He started as a Captain-owner, there has been tradition for shipowning for generations in this family. The company is in Mosterhamn (on an island between Bergen and Stavanger), which has a long tradition for single-ship companies. Over the years the company has developed into working mainly with self-dischargers.

Self-dischargers for Hagland Shipping

In a similar project to the Aasen Shipping deliveries, Royal Bodewes has also been working with Hagland Shipping.

The vessels for Hagland are also hybrid, but are smaller (4,750dwat compare to Aasen 9,400dwat) and have a bigger battery capacity on board (1,000kWh instead of 620kWh for Aasen).

Royal Bodewes delivered three new-build vessels to Hagland in 2022 and 2023, and a further four vessels have been ordered. The first ship out of the series of four will be delivered in March this year, and then every six months a new one will be handed over.

Compared to Hagland's existing fleet, the vessels are expected to reduce CO_2 emission by more than 30% and NOx emissions by 90–95% from delivery. The vessels will also be prepared for zero-emission.

Hagland is proud to have reached a new milestone in its history. The investment in these new builds is a major step forward for the company and its transition to low and zero emission vessels. The new vessels represent the start of a renewal of the fleet that is also necessary in order to reach the ambitious climate goals set by the shipping industry.

About Hagland Shipping

Hagland Shipping was established in 1983 and operates 14 self-discharging dry bulk vessels, trading mainly in Northern Europe. It is among the leading operators of self-discharging bulk vessels in the 2,500–7,000dwt vessel segment, commonly referred to as short sea shipping. Hagland Shipping's vessels are self-discharging bulk vessels in the 3,700–5000dwat range and carries mainly stone and wood materials, as well as other bulk cargoes for a range of industrial companies. The ship owning activities of Hagland Shipping had a turnover of NOK382 million in 2020, while the Hagland group, which also is engaged in shipbroking, real estate, and accounting services, reached a total turnover of about NOK450 million.

Rocktree: reshaping commodity infrastructure

How a global infrastructure logistics leader is reshaping commodity corridors on the Paraguay–Parana Waterway.

In the global landscape of commodity logistics, few operators can claim the ability to move large volumes through a coordinated, integrated set of logistics capabilities across strategic corridors like the Paragua–Parana Waterway, a critical artery for Brazil and Paraguay connecting inland production to global markets.

Rocktree stands out as one of the leading players in this segment, embodying an operational philosophy building deep local roots and developing open, right-sized routes.

The company's ethos is inspired by a tree growing on bare rock — roots find a way.

What is Rocktree?

Rocktree is a leading infrastructure service provider connecting production to consumption. Founded in 2007, the company today employs over 1,500 people across the Americas, Europe, Asia, and Africa, operating an integrated network of offshore floating terminals, tugs and barges, port terminals, shipyard and river transportation systems.

Rocktree develops infrastructure and logistics solutions that grow local economies and connect them to global markets. The vision is clear: to be the best logistics solution company in the world, making global trade more resilient, more efficient, and genuinely sustainable.

What sets Rocktree apart is its strategic approach. The company designs and operates trade routes that are resilient by structure. This means building deep local roots at origin through long-term investment in infrastructure, employment, skills, and local processing capabilities. It means developing open, right-sized routes that stay competitive through performance, connectivity, and scalability. And it means operating with efficiency over control, prioritizing flow over friction, competition over monopoly, and service over bureaucracy.

The Paraguay–Parana Waterway: a strategic corridor

The Paraguay–Parana Waterway represents South America's most important commercial artery, stretching over 4,000km through five countries: Argentina, Uruguay, Paraguay Bolivia, and Brazil.

For Paraguay, Bolivia and some regions of Brazil in particular, the waterway is a strategic backbone, enabling a scaled and cost-efficient access to international trade routes for bulk commodities. This corridor plays a crucial role in the exportation of agricultural and mineral commodities to global markets, connecting the productive hinterland areas with the Atlantic Ocean. For decades, this waterway has been the backbone of regional trade, enabling landlocked countries to access

international markets efficiently.

Rocktree enables offshore top-off operations that allow large ocean-going vessels to sail fully laden despite draught constraints at most Río de la Plata ports. This system of offshore stevedoring improves vessel utilization, reduces voyage inefficiencies, and enhances overall sustainability across the logistics chain.

At the core of this solution is *Mara*, a dedicated transshipment vessel operating in the Alpha and Delta Zones of the Río de la Plata. Since 2024, *Mara* has enabled the top-off of Panamax vessels and the full loading of Capesize vessels, maximizing cargo intake and improving performance for both mines and ship operators, despite widespread port draft constraints.

RT Tannat complements this setup as the primary shuttle vessel. Joining the fleet in early 2025, the dry bulk carrier *RT Tannat* transports iron ore from upriver ports such as Nueva Palmira to the offshore loading areas, ensuring a stable and scalable feed to *Mara*. In its first year, *Tannat* completed over 40 voyages to the Montevideo Alpha Zone.

Operations are now scaling rapidly, with volumes nearly quadrupling versus 2024. This has driven further efficiency gains and enabled a record 71 OGVs loaded in 2025, with significant headroom to expand throughput. The waterway's importance cannot be overstated. As global demand for raw materials continues to grow, driven by infrastructure development, energy transition, and population growth, efficient access to these resources becomes increasingly critical. The Paraguay–Parana Waterway offers a cost-effective and environmentally sustainable alternative to road transport, with river transportation driving significantly lower carbon emissions per tonne-kilometre moved. This aligns perfectly with Rocktree's commitment to delivering sustainability through viability — what survives economically, survives sustainably.

The Atria acquisition: a 360° integrated offer

The year 2025 marks a strategic turning point for Rocktree with the acquisition of Atria Soluciones Logisticas, one of the largest river logistics operators on the Paraguay–Parana Waterway. Founded in 1994, Atria brings a first-class portfolio of assets: 20 pushboats, 350+ dry barges, 70+ tank barges, two port terminals, a shipyard, and repair facilities. With over 500 employees and operations in five countries across more than 4,000km of waterways, Atria distinguishes itself as the sole operator of liquid cargo in the Alto Parana region and a primary operator for grains, offering dry and liquid bulk transportation along with integrated port services.

This operation enables Rocktree to manage operations at 360°, both via river and via sea, through an integrated corridor. Critically, the fully integrated company can now handle multiple commodities— not just iron ore, but also agricultural products, fertilizers, fuel oil, and other bulk cargoes that flow through the waterway. This diversification strengthens Rocktree's market position and provides clients with a versatile partner capable of supporting their evolving needs across different commodity segments.

Rocktree's convoys can now take a client's cargo from their mine in Brazil, transport it 2,500km to Nueva Palmira in Uruguay, have it loaded onto *RT Tannat* which then transports it to *Mara* which, finally, through its offshore stevedoring capabilities, loads it onto an ocean-going vessel. This vertical integration eliminates handoff delays, reduces the risk of cargo damage, and gives clients complete visibility over their shipments throughout the entire journey.

Value for clients: one operator, optimized costs

The integration of Atria generates tangible and immediate advantages for clients. Rocktree is now able to offer a fully integrated service along the entire logistics chain: from port handling to river transport, to ocean vessel loading. Clients can now purchase all handling services from a single operator, rather than having to interface with multiple different providers.

This integrated model translates into a significant improvement in the cost-capacity ratio. The elimination of operational duplications, the simplification of contract management, and the optimized coordination between different phases of the supply chain allow for reduced overall costs and increased efficiency. For clients, this means direct economic savings, greater service reliability, more predictable transit times, and a single point of contact for all logistics needs.

The benefits extend beyond cost savings. With integrated operations, Rocktree can provide better visibility across the supply chain, faster response to changing conditions, and more flexible solutions tailored to each client's specific requirements. This is what it means to be truly customer and future focused: anticipating needs and proposing solutions, not just answers.

Capacity and performance: strong growth

The operational results of 2025 demonstrate the strength of the Rocktree offshore stevedoring model in Uruguay. Volumes handled by *Mara* have nearly quadrupled compared to 2024, growing from approximately 750,000 to over 2.8mt (million tonnes). The number of ocean-going vessels served increased dramatically, handling both Panamax and Capesize carriers. At the same time, the average loading rate has increased by over 30%, exceeding 33,000 tonnes per day.

These numbers are destined to grow and demonstrate a concrete capability: Rocktree can handle significantly larger volumes with increasing effectiveness and efficiency. The infrastructure and know-how are ready to support the demands of current and future clients, with ample room for further growth. For existing and potential customers, this means partnering with an operator that has proven scalability and the operational excellence to deliver on its commitments. The trajectory is clear: more capacity, better efficiency, and a relentless focus on continuous improvement.

The values that drive excellence

At the foundation of Rocktree's success are shared values: Safety First as an absolute priority; Customer Focused to anticipate client needs; Excellence Together to collaborate and solve problems end-to-end; Passion & Perseverance to stay calm and relentless under pressure; Push Boundaries to challenge the status quo and drive innovation; and Quick & Nimble to act with speed and remove friction. These values translate into a promise: Rocktree makes the impossible possible. This is because at Rocktree, roots always find a route.

About Rocktree

Rocktree is a leading infrastructure service provider connecting production to consumption — building deep local roots and developing open, right-sized routes, making global trade more resilient, more efficient, and genuinely sustainable.

Founded in 2007, the company employs over 1,500 people across the Americas, Europe, Asia, and Africa, operating an integrated network of offshore floating terminals with annual capacity in excess of 75 million tonnes, more than 460 tugs and barges, river port terminals, and a shipyard and repair facility.

CSL Australia joins Green Iron SA consortium

In November last year, Green Iron SA, a consortium formed to accelerate the establishment of a green iron industry in South Australia welcomed CSL Australia Pty Ltd, part of Canada's The CSL Group Inc., as the newest member of the consortium.

CSL brings world-class maritime expertise to support the development of South Australia's emerging green iron industry, enhancing the consortium's capability to deliver a fully integrated green iron supply chain from mine to market.

CSL Australia is the country's largest owner-operator of self-unloading and transshipment vessels and has extensive operational experience in the Upper Spencer Gulf, where it manages a floating offshore transshipment system near Whyalla.

This system transfers iron ore from smaller feeder vessels to large Capesize vessels using self-unloading barges and telescopic shiploaders, a proven solution that directly aligns with Green Iron SA's logistics needs for bulk magnetite export from the region.

By joining the consortium, CSL complements Aurizon's rail capabilities and Flinders Port Holdings' port-infrastructure expertise, completing the transport corridor from mine to export market. Together with Magnetite Mines and GHD, the consortium partners are building the infrastructure and logistics framework required to unlock the Braemar Iron Region and establish South Australia as a key supplier of high-purity magnetite feedstock for green iron and steelmaking.

This milestone builds upon the establishment of Green Iron SA in October 2024 — a consortium launched by Magnetite Mines, Aurizon Holdings, Flinders Port Holdings, and GHD to spearhead the creation of a green iron industry in South Australia.

Dan Wilson, Vice-President, Commercial, CSL Australia Pty Ltd said: "CSL is proud to contribute its maritime expertise to the Green Iron SA consortium and help build a sustainable green iron industry in South Australia."

About CSL Australia Pty Ltd

CSL Australia Pty Ltd, established in 1999 and headquartered in Sydney, is the largest owner-operator of self-unloading and transshipment vessels in Australian waters. The company provides coastal shipping and port-logistics services supporting Australia's mining, construction and energy industries, including bulk-cargo operations in the Upper Spencer Gulf.

About The CSL Group Inc

The CSL Group is a world class provider of complex marine solutions and the largest owner and operator of self-unloading ships in the world. Headquartered in Montreal with operations throughout the Americas, Australia, Europe and Africa, CSL owns and operates a highly diversified fleet of specialized self-unloading vessels, offshore transshippers, cement carriers, bulk carriers and multi-purpose product vessels. CSL delivers millions of tonnes of cargo annually to industrial customers worldwide.

About Green Iron SA

Green Iron SA is a consortium formed by Magnetite Mines, Aurizon Holdings, Flinders Port Holdings and GHD to accelerate the establishment of a green iron industry in South Australia. Its phased development pathway begins with fast-tracking the Razorback Iron Ore Project to establish a secure supply of high-purity magnetite — a critical feedstock for green-iron production. The project then advances to the production of direct-reduction (DR)-grade pellets and, ultimately, the export of direct-reduced iron (DRI) in the form of Hot Briquetted Iron (HBI) through Port Pirie, delivering long-term regional and economic benefits.

Offshore stevedoring & transshipment: flexible, mobile solutions from Gulf and Atlantic Maritime Services LLC

As dry bulk and breakbulk trades continue to evolve, cargo owners and vessel operators increasingly require stevedoring solutions that extend beyond traditional terminal infrastructure. Mobile stevedoring and offshore transshipment have become critical tools for maintaining cargo flow where fixed facilities are limited or unavailable. Gulf and Atlantic Maritime Services LLC (GAMS LLC) has established itself as a niche, travelling stevedore by delivering adaptable, efficient, and safe cargo handling services wherever vessels call.

GAMS LLC operates across the Great Lakes, Northeast, Mid-Atlantic, Southeast, and Gulf regions, meeting vessels at docks, anchorages, and midstream locations. Rather than being tied to a single terminal, the company's operating philosophy centres on mobility, responsiveness, and problem-solving — mobilizing experienced crews, specialized equipment, and hands-on supervision to support vessel operations at virtually any dock within its service areas.

A core component of GAMS LLC's operations involves bulk carrier loading and discharge using vessels' deck-mounted cranes. Most vessels serviced by the company are fitted with electric over hydraulic clamshell grabs, also known as touch-and-go grabs, enabling efficient handling across a wide range of dry bulk commodities. Some of these commodities include road salt, alloys, aggregates, grains, fertilizers, coal, coke, DRI, HBI, gypsum, clinker, bauxite, potash, slag, sand, cement, clinker, and limestone. GAMS LLC routinely performs both loading and discharge operations, tailoring handling methods to cargo characteristics, vessel configuration, and site-specific conditions.

Road salt represents a significant portion of the company's activity, often discharged from vessel to dock at facilities with limited fixed infrastructure. In these

environments, the use of shipboard cranes and clamshell grabs, combined with experienced operational oversight, allows GAMS LLC to maintain consistent discharge rates while minimizing cargo loss and protecting berth structures.

Midstream vessel-to-barge transshipments are another key area of expertise. GAMS LLC conducts offshore and nearshore transfers using ship's cranes and grabs, co-ordinating closely with vessel crews and barge operators to ensure safe, continuous operations. In the Gulf region, the company has extensive experience handling bulk cement from vessel to barge, as well as bagged cement discharged either to barges or directly to dock. To enhance productivity during bagged cement operations, GAMS LLC has developed custom spreader bars designed to lift multiple cement bags fitted with pneumatic hooks. This in-house innovation significantly improves discharge rates while reducing manual handling and enhancing overall operational safety.

GAMS LLC also supports scrap metal operations, primarily for export cargoes,

while handling select import scrap movements as well. Scrap is handled using diesel over hydraulic orange peel grapples, allowing for efficient loading while maintaining proper vessel trim and stability. To supplement vessel equipment and support specialized operations, GAMS LLC maintains its own fleet of grabs, including 15m^3 orange peel grapples and 15m^3 clamshell grabs, which are available for rental.

In addition to bulk cargoes, GAMS LLC provides full gangs to perform stevedoring services on a broad range of breakbulk cargoes, including steel coils, billets, slabs, aluminum products, and various forms of project cargo. Each operation is carefully planned and executed with a focus on proper lifting arrangements, cargo protection, and safe stowage practices.

What differentiates GAMS LLC is its ability to adapt to the unique challenges presented by each port, dock, and vessel. By leveraging shipboard equipment, proprietary handling solutions, and highly experienced crews, the company delivers consistent performance across a wide geographic footprint without reliance on fixed terminal systems.

As infrastructure development remains uneven across many trading regions, mobile stevedoring and offshore transshipment solutions will continue to play a vital role in the dry bulk and breakbulk supply chain. GAMS LLC's proven ability to mobilize quickly, handle a diverse spectrum of cargoes, and execute complex operations using ship's gear positions the company as a trusted partner in today's evolving maritime logistics environment.

For over 35 years, EMS-Tech has delivered Transhipment systems that keep critical bulk materials moving - reliable, efficient and proven, voyage after voyage.

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Oldendorff Carriers: delivering one stop transshipment and freight solutions worldwide

Transshipment operation in Vietnam. Anna *discharging a Capesize vessel before returning to the discharge port to unload the cargo via her gravity belt system into the customer's shore hopper.*

Oldendorff Carriers (Oldendorff) has built one of the world's most advanced and reliable transshipment networks, offering an integrated model that enables clients to optimize freight economics, overcome draught restrictions, and secure efficient supply chain performance across remote, shallow, or infrastructure limited locations.

Today, Oldendorff handles approximately 23mt (million tonnes) per annum across seven transshipment locations. These operations are supported by purpose-built vessels, sophisticated cargo handling systems, and a fleet uniquely suited for both day to day lightering and emergency salvage operations.

What sets Oldendorff apart is the ability to combine ocean freight and transshipment under a single provider. This one stop solution allows customers to capture deep sea freight savings while relying on Oldendorff to bridge the gap between shallow draughted ports that cannot receive large vessels and the deep draughts required to utilize larger vessels. The result is a streamlined logistics chain with reduced operational risk, predictable cost structures, and strong schedule reliability.

Middle East transshipment operation. Alfred Oldendorff *discharging a Capesize vessel and transshipping the cargo via its boom conveyor onto a self-propelled and gravity discharging barge.*

Transshipment: enabling economical and efficient bulk logistics

Transshipment enables customers to benefit from the low unit cost economics of long haul Capesize freight while overcoming the draught constraints that limit access to many ports. Rather than deploying smaller ocean going vessels into restricted berths or investing heavily in dredging and port development, Oldendorff delivers cargo efficiently using specialized assets either offshore or at the discharge port. The approach is tailored to the specific point of constraint, whether at the loading or discharging end, ensuring efficient cargo flow while preserving cost advantages and operational reliability.

Global scale and proven capability

Across its global fleet of transshipment assets, Oldendorff combines purpose-built vessels, advanced cargo-handling technology, and operational expertise to deliver consistent performance at scale. High performance cranes, Emstech conveyor belts, dust collection systems, twin boom conveyors, and powerful thrusters are integrated into vessels designed to accommodate up to 40 personnel, enabling safe and efficient operations offshore.


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Daily handling rates exceeding 35,000 tonnes allow for the rapid turnaround of ocean-going vessels while minimizing exposure to weather related delays. Complementing this capability are shallow draught barge and feeder systems tailored to local bathymetry and cargo volumes, ensuring flexibility across a wide range of operating environments.

Every element of Oldendorff's equipment and systems is designed to deliver high volume throughput with low environmental impact, maintaining reliability even in the most demanding offshore conditions.

Transshipment operation in Turkey. The Isken *platform discharging coal from a Capesize vessel. The coal is transshipped onto barges which then discharge via gravity belt system into the coal plant's hoppers.*

Integrated freight and transshipment: a unique market advantage

What distinguishes Oldendorff is not only the scale of its transshipment infrastructure, but its ability to integrate this capability seamlessly with competitive long haul ocean freight. By offering a single contract that covers the entire logistics chain, Oldendorff removes the complexity often associated with co-ordinating multiple service providers.

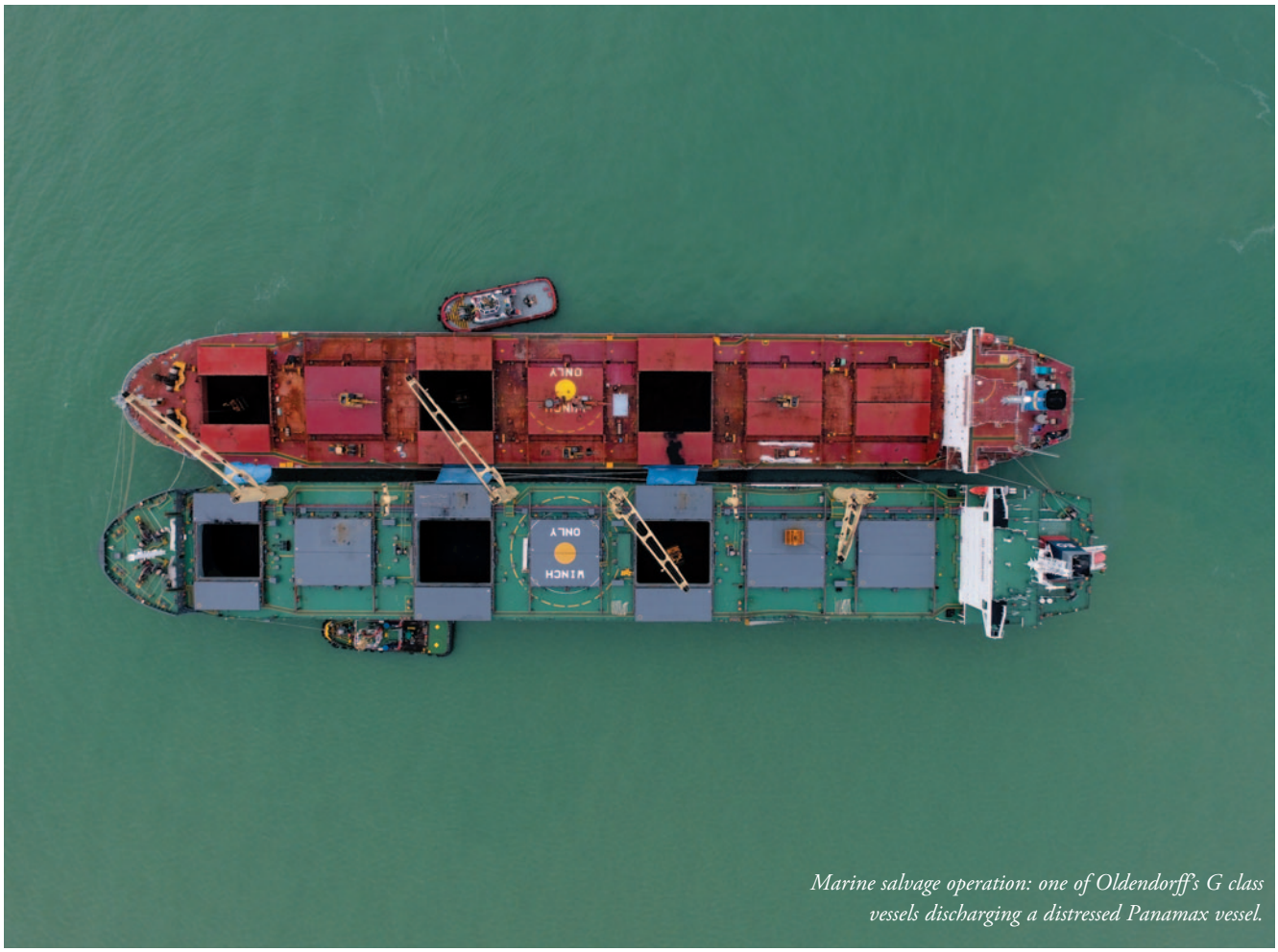
Customers benefit from optimal vessel size selection for the ocean leg, capturing cost efficiencies driven by Capesize economies of scale. With full accountability from load port to final delivery, operational interfaces are reduced, risks are minimized, and performance becomes more predictable. This integrated approach enables clients to unlock freight savings that would otherwise remain inaccessible due to local port limitations.

Regional expertise across diverse operating environments

Arabian Gulf: high volume lightering for iron ore and pellets

In the Arabian Gulf, Oldendorff lighters approximately 6mt (million tonnes) per year of iron ore and pellets arriving from Brazil, Canada, and Norway under long-term COAs. Offshore lightering enables deep draught Capesize vessels to transfer between 50,000 and 80,000 metric tonnes to a transshipment vessel, which then proceeds to the draught-restricted ports of Bahrain, Saudi Arabia, and Qatar for final discharge.

The eco type transshipment vessels deployed in the region, ranging from 84,000 to 93,500dwt, are equipped with high rate cranes, conveyors, and dust control systems. This combination ensures safe,



Marine salvage operation: one of Oldendorff's G class vessels discharging a distressed Panamax vessel.

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efficient, and environmentally compliant lightering operations in a high volume operating environment.

Turkey (Iskenderun): Offshore Platform Operations

In the Gulf of Iskenderun, Oldendorff's Turkish affiliate Iskolden, a joint venture with OYAK, operates the Isken offshore platform, an innovative solution designed to overcome significant port constraints.

Key features of the operation include:

- unloading Capesize vessels using three Liebherr MPG cranes;
- handling up to 50,000 metric tonnes per day of coal;
- loading self-unloading barges via conveyors and hoppers;
- using pusher tugs to deliver cargo to a nearby power station; and
- overcoming a 6m draught restriction at the plant's jetty.

This model provides a cost effective alternative to constructing a Capesize capable port, while maintaining high standards of environmental stewardship and operational reliability.

Kamsar, Guinea: offshore bauxite transshipment

At Kamsar, where draught restrictions prevent direct Capesize loading, Oldendorff transfers bauxite at a deep sea anchorage using dedicated transshipment vessels. *Albert Oldendorff* and *Johanna Oldendorff* together load a Capesize vessel in an average of 9.4 days, ensuring consistent and reliable supply for the customer's bauxite export program.

Operational performance is characterized by:

- *Albert Oldendorff* routinely achieving transshipment rates of 30,000 metric tonnes per day using her cranes; and
- *Johanna Oldendorff* routinely achieving transshipment rates of 23,000 metric tonnes per day using her five cranes.

Approximately 6mt per annum are handled through this high efficiency offshore system.

Vietnam (Nghi Son): one-stop coal supply including ocean freight and transshipment

Oldendorff has played a key role in supporting Vietnam's power sector through transshipment operations at Nghi Son, under a long term agreement with Nghi Son 2 Power Limited.

Key elements of the operation include:

- index-linked Capesize freight;
- two purpose-built 27,000dwt transloaders;
- offshore unloading of Capesize bulk carriers in deep water; and
- delivery to a terminal constrained by shallow draught.

Oldendorff provides both the ocean-going freight and the transshipment service for between 3mt and 5mt per year. The project highlights the company's ability to design, build, and operate dedicated transshipment assets for long term industrial customers, supporting supply security and reliable power generation for one of Vietnam's major coastal energy providers.

Trinidad: a strategic hub for the Americas

In Trinidad's Gulf of Paria, Oldendorff operates a sheltered transshipment hub supporting cargo flows from South American river systems, as well as top off services for vessels loaded in the US Gulf and along the East Coast.

The hub offers:

- access to low cost Capesize freight;
- efficient lightering from Supramax and Panamax vessels; and
- integrated one-stop shipping combining shuttle vessels, transshipment, and ocean-going freight.

This configuration widens market access for regional producers and strengthens cargo competitiveness across global trade routes.

A diversified, high performance fleet

Oldendorff's transshipment fleet includes large scale transloaders, self unloaders, and geared Kamsarmaxes, such as:

- *Antonie Oldendorff:* 94,000dwt; up to 2,000tph (tonnes per hour);
- *Alfred Oldendorff:* 94,000dwt; up to 2,000tph;
- *Anna Oldendorff:* 84,000dwt; up to 2,000tph;
- *Albert Oldendorff:* 90,0000dwt; up to 2,000tph;
- *Johanna Oldendorff:* 67,000dwt; up to 1,500tph;
- *Anna:* 27,000dwt; up to 2,500tph;
- *Calypso:* 27,000dwt; up to 2,500tph;
- *Gretke Oldendorff:* 80,000dwt; up to 1,000tph (in total six sister vessels);
- *Isken:* floating transshipment platform; up to 3,000tph; and
- *Maggie:* floating crane; up to 1,000tph.

These assets are optimized for offshore operations, combining powerful cranes, high capacity conveyors, and design features designed to reduce environmental impact, such as minimized dust and spillage.

Marine salvage: rapid, capable, and globally deployed

While transshipment is a core pillar of the business, Oldendorff is equally recognized for its capability in bulk cargo salvage, providing emergency response and ship to ship extraction services during maritime incidents.

Many ports lack the assets required for large scale bulk salvage, and as environmental regulation continues to tighten, the need for fast, controlled cargo recovery has become increasingly critical.

Offshore salvage operations often demand the same equipment, expertise, and operational discipline as offshore transshipment, an area in which Oldendorff already has extensive experience. This overlap allows the company to mobilize quickly and operate effectively when incidents occur.

Oldendorff's transloaders and geared

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Kamsarmax vessels are equipped with:

- side-mounted cranes capable of unloading full size Capesize bulk carriers;
- high-capacity grabs and conveyors enabling rapid cargo removal;
- precise manoeuvring systems that support safe proximity operations; and
- multi region mobility allowing swift repositioning to incident locations.

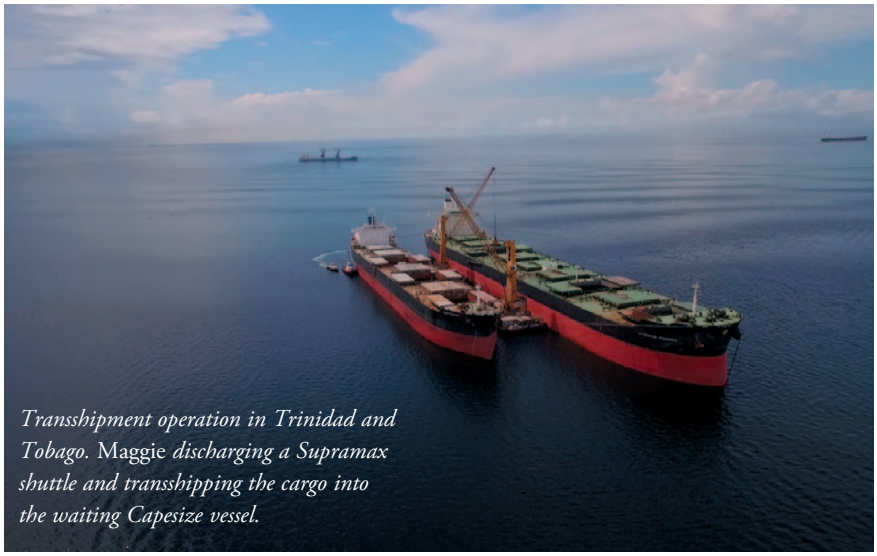
With 11 vessels positioned worldwide, including three in the Arabian Gulf, two in West Africa, and six trading globally, Oldendorff maintains a high level of rapid response readiness. To date, the company has successfully completed 14 major ship to ship salvage operations, supporting distressed vessels, restoring stability, and preventing environmental harm.

This capability ensures that, beyond commercial lightering activities, Oldendorff can provide effective support in emergency cargo removal, vessel stabilization, and environmental protection when unforeseen incidents arise.

Expanding horizons: new projects in the global portfolio

In addition to its long established hubs, Oldendorff continues to expand into new regions. One of the latest projects is in the Cocos (Keeling) Islands, where Oldendorff will support the Australian Government by transporting aggregates under extremely shallow draught and environmentally sensitive conditions. Operations are scheduled to commence in Q3 2026.

The project underscores Oldendorff's broader expertise in delivering logistics solutions in remote and technically constrained environments, where careful planning, specialized assets, and operational discipline are essential.



Transshipment operation in Trinidad and Tobago. Maggie *discharging a Supramax shuttle and transshipping the cargo into the waiting Capesize vessel.*

Conclusion: a truly integrated solution for bulk supply chains

Oldendorff has developed a transshipment and salvage portfolio defined by reliability, innovation, and customer focused logistics. By seamlessly integrating long haul ocean freight with offshore transshipment, the company offers a one-stop solution that reduces costs, minimizes interface risk, and ensures smooth cargo flow from load port to final delivery.

With an expanding global footprint spanning the Arabian Gulf, Turkey, Guinea, Trinidad, Vietnam, and now the Cocos (Keeling) Islands, Oldendorff continues to set industry benchmarks for safe, efficient, and environmentally responsible bulk transshipment.

Offshore cargo handling at NORDEN

Offshore cargo handling has become a critical enabler of global commodity flows, particularly in regions where port infrastructure is constrained or where exporters seek faster, more flexible alternatives to traditional port operations. NORDEN's offshore logistics offering is designed specifically to help customers overcome barriers by providing reliable, scalable, and cost efficient solutions that keep cargo moving.

NORDEN is strengthening its position within logistics capabilities globally by developing a scalable model for offshore logistics and transshipment, combining decades of maritime expertise with customer centric, integrated freight solutions. NORDEN's offshore cargo handling operations, including transshipment, floating crane services, and integrated port to port logistics play a strategic role in supporting mining, metals, and energy customers across Africa, Australia, and Asia. By pairing its fleet flexibility with specialized offshore equipment, NORDEN helps customers move commodities more efficiently, reliably, and with lower emissions.

"During 2025, we expanded the multi-purpose vessel (MPP) and Logistics

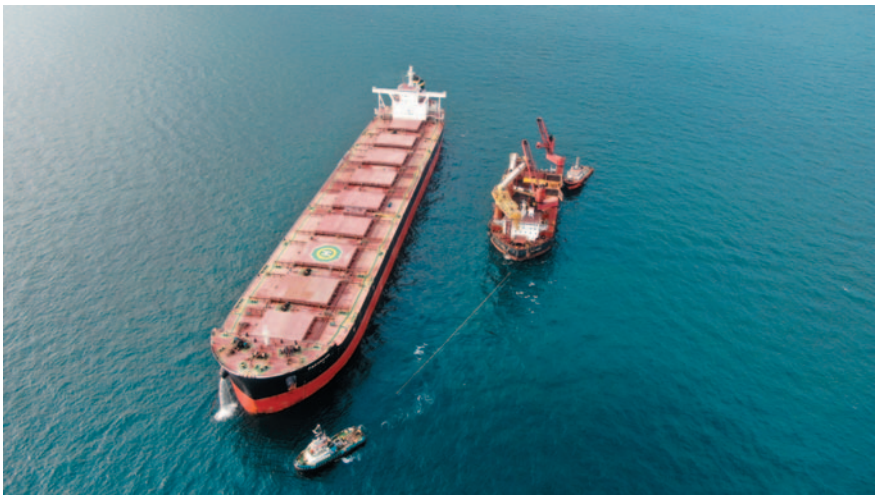
activities, strengthened our specialist parcelling offering through the acquisition of the Southern African cargo activities of Taylor Maritime, while overall reinforcing customer focus via targeted strategic partnerships. Each of these initiatives represents a deliberate step in advancing the strategy, highlighting the direction we are taking to create long-term value" says Jan Rindbo, CEO at NORDEN.

Integrated freight and logistics solutions

A core differentiator for NORDEN is the ability to offer an end to end logistics setup, from mines or port facilities to ocean-going vessels, built on direct control of both freight and offshore assets. Rather than functioning as a traditional ship operator, NORDEN assumes full responsibility for the entire freight operation, including ocean transportation, transshipment, and the floating infrastructure needed to move cargo from shore to deep-sea vessels.

This integrated approach reduces fixed costs for customers, improves supply chain stability, and lowers overall carbon footprints. By acting as a one-stop-shop, NORDEN also absorbs operational risks typically associated with multi-stakeholder offshore setups, ensuring reliable and predictable performance from origin to export vessel.

NORDEN currently operates offshore cargo handling projects in three geographically diverse locations: Gabon, Guinea, and Australia, each designed around the specific commodity, customer needs, and local conditions.



Serving the manganese supply chain in Gabon

In Gabon, NORDEN supports manganese ore exports for Comilog. The operation includes:

- one floating transfer station;
- five tugs; and
- three barges.

This setup ensures efficient movement of manganese ore from shallow loading points to larger ocean-going vessels. Loading rates typically range between 1,000–1,500 metric tonnes per hour, depending on cargo and equipment.

Bauxite logistics for Africa Oil Supply in Guinea

NORDEN recently began a significant offshore logistics contract in Guinea with Africa Oil Supply, scheduled to scale in early 2026. Under the agreement, NORDEN handles bauxite transport from the CBG jetty to an offshore transshipment site using Panamax vessels. From there, cargo is loaded onto Capesize vessels for shipment to China, an arrangement that optimizes vessel utilization and reduces freight costs.

The operation includes:

- two floating cranes;
- two Panamax shuttle vessels; and
- two tugs.

This project marks an important expansion of NORDEN's offshore footprint in West Africa and supports the rising global demand for bauxite.

Strengthened partnership with Kimberley Metals Group in Australia

In May 2025, NORDEN took a significant

step toward building a global logistics platform by securing its first port logistics project in Australia. Working with Kimberley Metals Group (KMG), NORDEN provides barges for iron ore export operations at the port of Wyndham in Western Australia.

In May 2025, NORDEN strengthened the partnership with Kimberley Metals Group (KMG) by securing its first port logistics project in Australia, marking a strategic step in scaling NORDEN's global logistics platform. The project, located at the port of Wyndham in Western Australia, supports KMG's iron ore export operations by providing barges for the existing transshipment operation, moving cargo from port facilities to barges and onward to ocean-going vessels.

The project reflects:

- support for the transshipment of iron ore from port facilities to ocean-going vessels; and
- the launch of the first barge in mid-2025.

Flexibility across commodities and equipment

NORDEN's offshore logistics solutions are built to handle a wide range of dry bulk commodities, including bauxite, metal ores and coal. This versatility is supported by an adaptable fleet of offshore equipment, such as floating cranes, barges, transfer stations, and shuttle vessels. NORDEN acts as a service provider, sourcing the right assets and solutions based on each project's requirements. Rather than pushing a predefined solution, NORDEN assesses every project individually and evaluates which operational design best serves the customer.

"We look at each project and put ourselves in the customer's shoes. We try and find the best solution for the customer regardless of whether it is a floating crane, a transshipment vessel, or a floating transfer station," says William Wallace, Head of Logistics, NORDEN.

The new projects illustrate how NORDEN's logistics strategy is taking shape globally. They are more than standalone commercial agreements, they demonstrate NORDEN's ambition to move up the value chain by combining freight and logistics into a unified, scalable service offering. By integrating logistics with freight, NORDEN creates stable, recurring revenue streams enabled by scale, asset flexibility, and strong customer relationships. These qualities also differentiate NORDEN in a highly competitive offshore logistics market.

Adds Wallace, "These new projects reflect our strategy to move up the value chain by combining freight and logistics, strengthening customer relationships and generating more stable, long-term earnings".

Technology and data supporting operations

Offshore cargo handling is inherently complex, often requiring real time coordination between barges, tugs, floating cranes, and vessels. NORDEN's digital capabilities, ranging from voyage optimization tools to fleet-data intelligence support safer and more predictable operations. NORDEN enhances insight and performance through data-driven planning, predictive maintenance, and optimization algorithms that improve fleet deployment and reduce idle time. These digital competencies are embedded in NORDEN's broader corporate strategy of using intelligence and agility to support customers, reduce emissions, and improve operational efficiency.

A long maritime heritage behind a modern logistics platform

Founded in 1871, NORDEN is one of Denmark's oldest internationally operating shipping companies. Today, the company combines that 150 year legacy with a global logistics mindset and an agile commercial model. With offices across six continents, NORDEN is a truly integrated part of global trade.

By integrating logistics with freight and leveraging its global platform, NORDEN aims to deliver smarter, more reliable offshore services and to continue moving up the value chain with a customer first mindset, and an agile approach to designing logistics solutions. NORDEN is well positioned to continue shaping the offshore cargo handling landscape.

GENMA New Tech Series: meet the 'Harmonic Police; in the company's transshipment system

A complete transshipment system built by GENMA has recently entered the final assembly stage. Composed of one shiploader, one belt conveyor system, two hoppers, and two deck cranes, this 'steel team' will soon be ready to work together at sea, efficiently handling bulk cargo operations.

But when all this equipment starts up and operates simultaneously, an invisible challenge emerges — the entire electrical system undergoes an intense 'stress test'.

Today, the company is introducing a behind-the-scenes 'hidden tech' from GENMA that keeps this team powered up and running smoothly.

A HIDDEN CHALLENGE: ELECTRICAL 'ROAD RAGE'

The heart of the transshipment system is its electric drive system. Think of it as a powerful 'driver' behind the wheel.

Here's the thing: this driver doesn't operate like most of us do. Instead of pressing the accelerator steadily, it rapidly switches between 'flooring the gas' and 'hitting the brakes' — thousands of times per second!

WHY DRIVE LIKE THIS?

It's all about precision control. By adjusting the timing between 'gas' and 'brakes,' the system finely tunes the motor's speed and torque. That's the core of frequency conversion technology. But there's a side effect: this rapid 'go–stop–go–stop' action creates intense current fluctuations and spikes in the power grid — known as harmonics. It's like the jerky, bumpy ride you feel when a car constantly accelerates and brakes hard. This 'electrical road rage' causes real trouble:

- **1. Stresses the 'engine':** overworks the onboard generator, causing extra heat and shortening its life.
- **2. Confuses the 'brain':** interferes with precise control systems, which can lead to errors or shutdowns.
- **3. Wastes energy:** creates reactive power, wastes electricity, and makes cables run hotter.

GENMA'S SOLUTION: A 'SUPER-SMOOTH TRANSMISSION' + 'ACTIVE SUSPENSION' FOR THE POWER SYSTEM

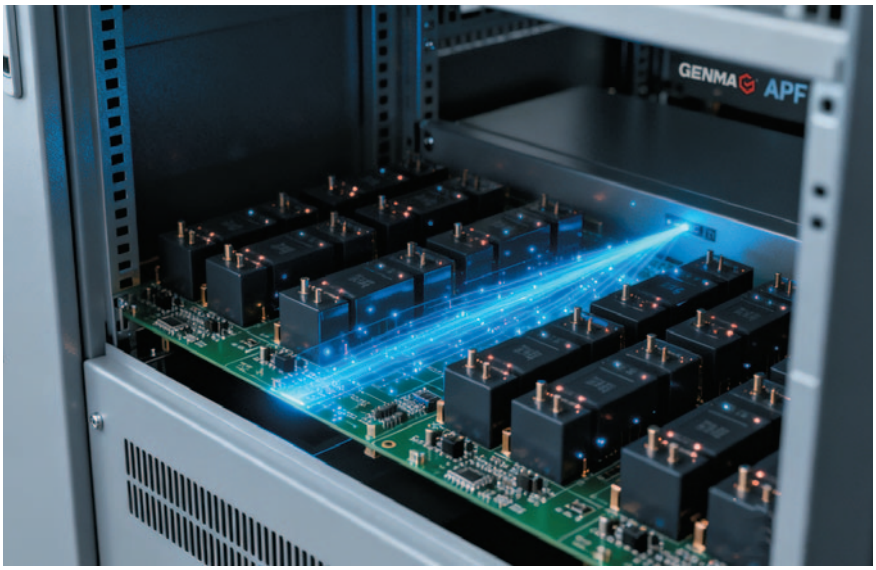
To tackle this, GENMA equips the transshipment system with an intelligent solution — the APF (Active Power Filter).

Think of it as an instant 'shock absorber' for the power supply:

- **Real-time sensing:** constantly monitors all the 'bumps' (harmonics) in the current.
- **Lightning-fast calculation:** instantly works out the exact 'counterforce' needed.
- **Active cancellation:** injects an opposing current that perfectly neutralizes the disturbances.
- **The result:** power returning to the grid and equipment becomes smooth, steady, and stable. No matter how aggressively the 'driver' operates, the 'passengers' (the electrical system) enjoy a smooth ride.

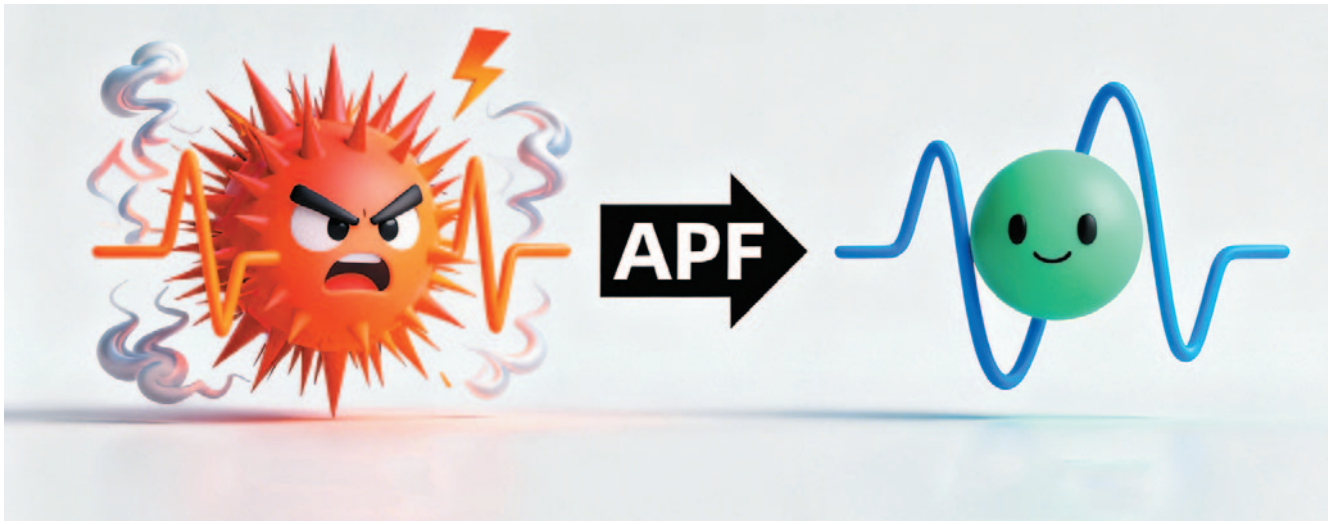
What does this mean for GENMA's customers?

- **Longer equipment life:** critical components run on clean, stable power, reducing wear and extending service life.
- **Smoother operation:** control systems stay interference-free, movements remain precise, and unexpected downtime from power issues becomes a thing of the past.
- **Smarter energy use:** less waste from harmonics means higher efficiency and real cost savings.
- **Hassle-free maintenance:** the APF works quietly in the background with minimal attention, saving time and trouble down the line.



So GENMA's reliability isn't just about strong builds and smart systems — it's also built on stable, clean power from the source. GENMA believes that inner steadiness is what makes outer strength possible.

GENMA will continue to focus on these core technologies that deliver long-term value, using smarter, greener innovations to ensure every GENMA machine is a reliable, high-performing partner on its customers' sites. DCi



Agribulk boosts Puerto Panul's traffic to new high

In Chile, Puerto Panul, which holds a concession to handle dry bulk at the Port of San Antonio, reports record traffic of 3.451mt (million tonnes) at its facilities in 2025. This beats the previous annual high of 3.3mt, which was recorded in 2020, and also represents a 5% increase over 2024. Puerto Panul achieved this despite operating from just a single berth terminal at the Pacific port.

According to the company's managing director, Cristian Valenzuela, the target in 2026 is to attract 3.5mt of traffic. Furthermore, in the remaining four years of its concession, the hope is to grow annual business to 4mt.

One of the keys to ensuring that Puerto Panul remains attractive to clients has been improved equipment maintenance. This has ensured that the terminal is now able to handle a continuous flow of imported corn, wheat, soybeans, and, to a lesser extent, malt.

Significantly, in 2025, the terminal resumed operations involving consignments of imported salt.

However, the future of the terminal remains uncertain. Its concession to undertake dry bulk operations at Berth 8 expires on 1 January 2030. That particular area of the port is earmarked for future tourism development. One solution could be to move the operator's business to the proposed Outer Harbour development.

Barry Cross

Lavna export coal terminal expansion continues

In Russia, the far northern port of Murmansk has put into operation new facilities at the Lavna Coal Handling Complex. These form part of a planned expansion phase. This, in concert with other previously commissioned facilities, has boosted the port's production capacity to 12 million tonnes of coal per year. According to the State Transport Leasing Company (GTLK), which is responsible for the construction of the port complex and investment management, such a volume represents 67% of the Lavna terminal projected capacity.

Recent upgrades are part of the Phase 1.3.1 development, and include construction of a 508m² transfer station, three conveyor racks with a total length of 145.7m, and a new coal stockpile area.

Lavna's strategic position in the Arctic allows it to export coal via the Northern Sea Route from what are deep-water and all-year-round ice-free facilities. The first export coal shipment from the Lavna terminal took place in March last year.

Barry Cross

New berth at Odessos PBM Varna Port Terminal

Odessos PBM Varna Port Terminal has added an important step in the development of modern Bulgarian port infrastructure. A new berth with a length of 221m and a design depth of 12.78m was put into operation, which provides: the opportunity to receive ships with draughts up to 12.5m; additional storage areas; a modern cargo testing area with automated probes; new truck scales; and a second entry-exit portal, all of which significantly increase the throughput, efficiency and logistical flexibility of the terminal.

The quay wall is constructed using the proven ArcelorMittal HZM-AZ structural system, which has proven its reliability, durability and resistance under harsh operating conditions in port facilities around the world.

The project was implemented with a focus on sustainable development and environmental protection throughout the entire cycle, from the production of structural elements to construction and installation activities, saving 2,230 tonnes of carbon emissions. This is a significant contribution to the decarbonization of transport infrastructure and the achievement of European climate goals.

Bulgarian and European companies participated in the implementation of the project, bringing together experience, technologies and good practices at all levels from design, through the supply of structural elements, to the implementation of standard and specialized construction operations. The designer of the facility is 'Transproject' EAD. The main contractor is 'Milkos Engineering' OOD, and the subcontractor for the 'Hydrotechnical Facilities' part is the Romanian company Dewatering and Silent Piling SRL, established in the construction of port infrastructure in the region.

The new cargo screening area with automated probes ensures fast, precise and reliable control of bulk cargo in accordance with international requirements and good port practices. The additional scales and the second gantry significantly optimize vehicle traffic and improve the throughput and safety of the terminal.

The transshipment operations at the new berth at this stage will be carried out with Liebherr mobile port cranes with hybrid drive, operating on both diesel and electric power. This technological solution contributes to the reduction of harmful emissions, noise and operating costs, while ensuring high productivity and operational flexibility. The storage capacity for bulk cargo in the terminal's covered warehouses is 60,000 tonnes of wheat equivalent. The port operator also has an additional covered storage area for another 60,000 tonnes. All facilities are under constant video surveillance, the activities of which are monitored by a video surveillance center performing a key task in the security plan. If necessary, access can be customized for the client.

The implemented expansion of the Port Terminal Odessos PBM – Varna creates additional opportunities for the future development of the region as a potential logistics hub on the axis between Asia and Europe. The geographical location, the provided depths and the modern infrastructure reveal significant potential for the inclusion of the port in the transport and trade flows formed within the framework of the 'One Belt, One Road' initiative, as well as for its establishment as a reliable maritime alternative and a complementary element to the European Transport Corridor No. 7, connecting the intracontinental network along the Danube River with the Black Sea region.

LOGISTEC expands international reach through acquisition agreement of IPA Terminal in Altamira, Mexico

LOGISTEC, a prominent North American marine and logistics service provider, has successfully entered into a definitive agreement to acquire 100% of IPA Terminal (IPA, ATEMSA, SMA, STEEL, collectively "IPA"), a state-of-the-art breakbulk and steel handling facility, at the Port of Altamira, Mexico. This acquisition expands LOGISTEC's presence to Latin America and marks a significant milestone in its vision as a global multi-purpose marine terminal operator.

"This expansion is a defining moment for LOGISTEC, as we position our organization for accelerated international growth," said Sean Pierce, CEO of LOGISTEC. "Mexico is a dynamic market, and by acquiring IPA, we are extending our reach, connecting our network to key industries, delivering value-added cargo solutions and opening new global opportunities for our customers and partners."

"This agreement with LOGISTEC will allow IPA to create significant and exciting opportunities for its people, customers and the Altamira communities where the company operates," said IPA's Co-CEOs. "This transaction builds upon Mexico's important role in the global supply chain and opens the door to new trade connections."

IPA Terminal is a pivotal hub in handling specialized breakbulk and steel commodities in the Gulf of Mexico, serving major industrial customers and regional supply chains. With modern infrastructure, deepwater access, and skilled workforce, IPA brings strategic value to LOGISTEC's portfolio by expanding market reach and operational excellence.

Completion of the transaction remains subject to the satisfaction of customary closing conditions and the receipt of applicable regulatory approvals from Comisión Nacional Antimonopolio (Mexican Antitrust Commission, previously COFECE) and the Mexican Port Authorities and Navy.

Berenson & Company, LLC acted as financial advisor to LOGISTEC, Holland & Knight served as the legal advisor.

About LOGISTEC

LOGISTEC is based in Montréal (QC) and provides specialized bulk, breakbulk and container cargo handling services, and logistics solutions, including trucking and warehousing, to marine and industrial companies across its North American network of 63 ports and 86 terminals. LOGISTEC also offers marine transportation services in the Arctic and marine agency services for ship owners and operators.

Qingdao uses AI to berth bulk carriers

In China, the Port of Qingdao reports that it was able to successfully berth a bulk carrier loaded with iron ore using an artificial intelligence (AI)-based system. The port made use of its newly developed Berth Planning Agent, which is now being used to analyse elements such as vessel schedules and tide data, as well as other operational constraints, in real time.

It takes but a few seconds for the system to identify the optimum berthing plan and relay all necessary information pertaining to that to operators of port equipment and terminal systems. Previously, vessel berthing was one of the most labour-intensive steps in port operations. Its complexity was such that planners had to manually integrate 132 different vessel-related variables and additionally review plans several times a day. Were a vessel's schedule to be modified, this would mean that all calculations pertaining to it would have to be recalculated.

The new system, which was initially put into operation in November of last year, is being constantly refined in line with real-world scenarios, something which affects each new vessel. According to the port, currently, AI berthing accuracy has reached around 80%.

AI usage spreads to other areas of the port

At Dagang, where general cargo and dry bulk operations are undertaken, security concerns have resulted in CCTV cameras now being linked to AI to improve security detection. Nowadays, each camera is aware of 208 protocols covering major port regulations and general rules. It therefore is able to monitor 99 potentially critical, high-risk scenarios, and so captures images and sends alerts as soon as a violation occurs.

In other areas, AI monitors the conveyor belt system, reviewing video feeds to identify the presence of unwanted, foreign objects.

The port claims a 99.8% detection rate with minimal false alarms. On stacker-reclaimer operations, it uses combined camera and radar feed to accurately measure distances, avoid collisions, and handle material more intelligently. This has allowed automation in these operations of around 94%.

Barry Cross

On coal's horizon

developments at coal terminals

UBT, located in Davant at Mile Marker 55 on the East Bank of the Mississippi River.

Jay Venter

T Parker Host expands on the Mississippi River

T. Parker Host's (Host) presence on the Lower Mississippi River began in 2011 with the acquisition of the NSA ship agency network, which included an office in New Orleans. From that foundation, Host steadily expanded its agency services in the region and now handles more than 800 vessel calls annually along the Lower Mississippi River.

In 2014, Host became the operator of the newly constructed Drax Biomass wood pellet export terminal in Port Allen. In 2017, the company expanded its terminal operations to include loading services at the Louis Dreyfus Company grain elevator. Both facilities continue to operate safely and efficiently under Host's management.

In 2018, Host acquired the former Avondale Shipyard, now known as

ABT is located at Mile Marker 156 on the East Bank of the Mississippi.

Dome at ABT.

Avondale Global Gateway — an active multimodal port facility supporting tenant operations as well as an integrated terminal specializing in breakbulk, bulk, and project cargo services.

Within the coal and petroleum coke segment, Host owns and operates two strategically located facilities. United Bulk Terminals (UBT), located in Davant at Mile Marker 55 on the East Bank of the Mississippi River, was acquired in 2019. Through targeted capital investment, equipment modernization, and operational integration, UBT has evolved into a high-capacity facility capable of handling up to 12mt (million tonnes) annually. The terminal also controls approximately three miles of river frontage and more than 1,000 acres of adjacent property, providing significant opportunity for future industrial development.

In 2022, Host expanded UBT's capabilities by adding midstream buoys equipped with two floating E-Cranes, significantly increasing loading efficiency and enhancing service flexibility for customers.

Host's growth along the Lower Mississippi continued in 2025 with the acquisition of the Burnside Terminal from Trafigura/Impala. Now operating as Ascension Bulk Terminal (ABT), the facility is located at Mile Marker 156 on the East Bank of the river. ABT features state-of-the-art continuous barge unloading and vessel loading systems, with an annual throughput capacity of up to 6mt.

Complementing its shoreside operations, ABT also offers strategically positioned midstream buoys that not only enhance throughput capacity for coal and petroleum coke, but also serve as a critical supply chain link for aggregates, pilings, and other construction materials supporting major industrial developments in Ascension Parish. These projects include the Air Products clean energy complex, the Hyundai steel mill, and the CF Blue Ammonia project — all currently under development in close proximity to ABT.

ABT further features a storage dome designed for biomass (bagasse pellet) exports. The dome provides between 35,000 and 45,000 tonnes of storage capacity, with truck receiving capability and barge or vessel loading. An inbound barge receiving system can also be added to accommodate future customer needs. Additionally, the terminal is located near the Canadian National Railway (CN) mainline and has sufficient land available to develop a loop track, creating future rail-served opportunities as market demand evolves.

Together, these investments reflect T. Parker Host's long-term commitment to expanding its footprint and enhancing its service capabilities along the Lower Mississippi River.

PD Ports coal terminal development

Tees Bulks Quay - direct to tipper truck.

PD Ports is continuing to demonstrate versatility and flexibility at its Teesport Bulks Quay, welcoming a new flow of coal cargoes through the terminal in the last 12 months and delivering major successes for customers.

A result of continued commitment to innovation, the port operator has already vastly enhanced discharge rates in the year following the first vessel arrival, using eco-hoppers, matched cranes and integrated onward logistics solutions to maximize efficiencies.

This reflects the benefits of PD Ports' ongoing programme of upgrading handling equipment in line with customer requirements and a drive towards sustainability without compromizing on the seamless service customers require.

Improving efficiency

PD Ports, through its experienced workforce, challenged the original configurations used on the initial coal shipment into Tees Bulks Quay with the belief that further improvements could be recognized for its customer, M&G Solid Fuels.

The *Lady Monica* arrived in February 2025 carrying 27,502 tonnes and completed discharge in 108 berth hours; an average of 254 tonnes per hour through periods of harsh weather, using smaller grabs discharging directly into tipper trucks.

For the mv Angele, which came into Teesport in January 2026, a new configuration was introduced, using larger grabs combined with PD Ports' Liebherr electric-hydraulic rail-mounted crane to discharge through eco-hoppers.

The 45,075 tonne shipment was safely and effectively discharged in just 114 berth hours — a rate of 395 tonnes per hour — offering huge enhancement in turnaround time.

Michael Parker, Commercial Director – Bulks, said "The contrast between the two configurations was a deliberate action on our part.

"Direct-to-wagon flows can be optimal for certain parcels and weather windows, while hopper-led flows can deliver steadier rates and tighter environmental control."

On-going investment

Investment in the Teesport Bulks quay in recent years includes two £9m Liebherr electric-hydraulic cranes which can lift 140 tonnes (with a third on order to arrive imminently) plus self-propelled eco-hoppers. The aim is to improve productivity and cut vessel time in the port.

The Buttimer eco-hoppers sustain high throughputs while minimizing dust — improving visibility and general housekeeping on the quay and helping terminals to meet tightening environmental regulations.

Tees Dock's eco hoppers have a two-stage inlet, wind-shielding shrouds and reverse jet-filtration to capture dust and recycle fine particles back into the product stream.

"The investment in Tees Bulks means our operatives have flexibility about grab selection and can set up to match the needs of specific situations," explained Michael.

"On the day, grab selection is just as important as the crane behind it. Larger, well-matched grabs maximize the fill factor and reduce cycle count, while smaller grabs can be the right choice for certain products or the layout of a particular vessel's hold.

"The eco-hoppers further boost performance and are designed to match crane/grab performance with the ability to discharge either to conveyor or direct to truck."

Last mile logistics

While PD Ports has demonstrated that innovation in handling solutions can provide enhanced discharge speeds, bottlenecks can still occur if the supporting rail or road infrastructure can't keep up.

PD Ports' port-centric offering — which includes a recent £1m investment in an in-house bulks tipper fleet accredited

for food/feed flows — aims to align ship-side performance with dependable onward transport to turn vessels fast and support customers distribution.

Michael added that "Across Teesport Bulks Quay we've looked at the range of commodities we handle and we've targeted investment in equipment and people in the right places to lift discharge performance across the board.

"Our work with the initial coal flows proves the value of flexibility and having the right equipment for the right job. Our discharge rates are only going to improve as the flows continue.

"Customers tell us they value efficiency, careful handling of the product and reduced vessel times in port. At Teesport Bulks Quay we're in a position to achieve those aims, while also reducing the environmental impacts."

Tees Bulks Quay.

PD Ports bulks operations – further info

PD Ports' flexible operations ensure its locations at Teesport, Hartlepool and the Humber can handle metals, aggregates, coal, recyclates, agribulks, construction materials, waste products, forest products and biomass.

With three berths all at 14.5m LAT, the Tees Bulks Quay has the capacity to support panamax vessels carrying vast amounts of cargo either to or from the continent and beyond.

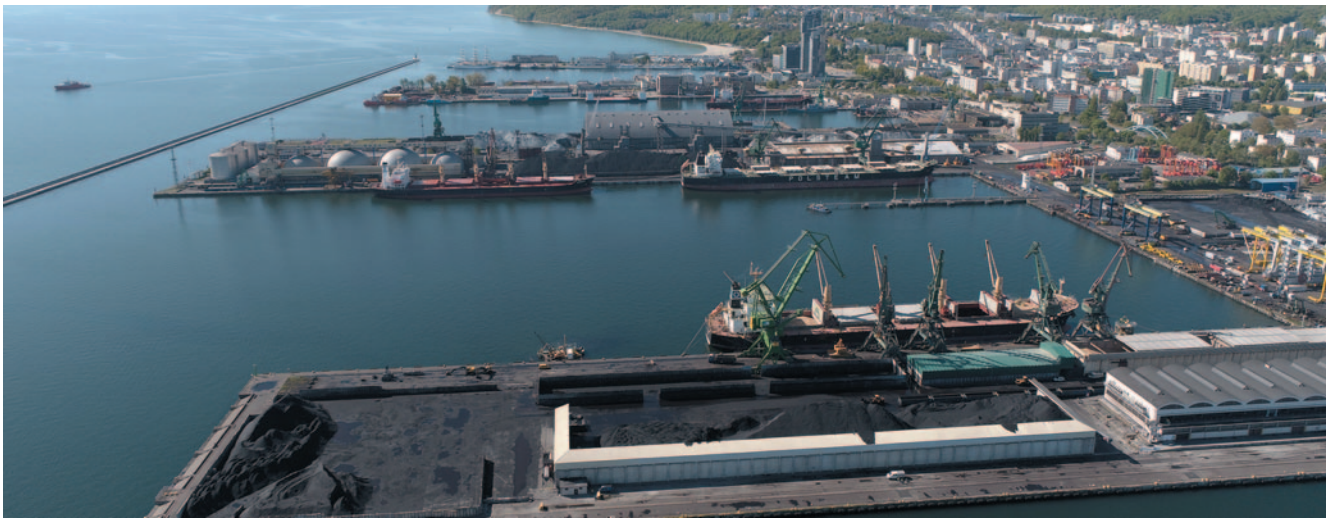
PD Ports' Liebherr electric hydraulic cranes at Teesport offer 140 tonnes lifting capacity, providing flexible solutions and the capacity to perform tandem lifts for more complex and heavy project cargo.

Each site offers extensive storage and handling options, with covered and open warehousing available, as well as temporary storage duty suspension or the option of bonded facilities.

Added-value services include processing, bagging, screening, cargo handling and in-house logistics.

Many of the company's sites hold specialist waste licences to handle, store and transport bulk cargo direct from the port.

The Port of Gdynia's modern infrastructure allows for efficient handling



Coal continues to play a role in the cargo structure of the Port of Gdynia, reflecting both Poland's energy needs and ongoing changes in the global fuel market. Although the port has been steadily expanding its handling of general cargo, coal remains an important bulk commodity, particularly in periods of increased demand for energy security.

The Port of Gdynia's modern infrastructure allows for efficient handling of coal and coke while maintaining high safety standards. At the same time, the share of coal in total throughput has been subject to fluctuation, influenced by energy policy, market conditions, and the gradual transition toward cleaner energy sources. Coal is increasingly viewed as a transitional cargo — significant in the short term yet gradually giving way to more sustainable and value-added cargo segments in the long-term development strategy of the Port of Gdynia.

In recent years, the role of coke has been growing in the cargo profile of the Port of Gdynia, reflecting Poland's increasing participation in global metallurgical supply chains. Coke — a key raw material for steel production — is becoming an important export commodity handled through the port, with substantial volumes shipped to international markets. According to trade statistics, Poland's total coke exports have consistently been around 5.8–6.9mt (million tonnes) annually in recent years (with approximately 6mt exported in 2024), underscoring the country's strong presence in this segment of bulk cargo trade.

Efficient bulk handling logistics

from mine-to-rail with RAM Revolver reachstacker CBH

Solurail, based in Val-d'Or, Québec, is a specialist in road and railway logistics, transloading, wagon movement, storage and equipment rental/distribution in the rail sector.

Within the growing lithium supply chain, a large hard-rock lithium mine in Québec producing spodumene concentrate required a logistics partner capable of moving the bulk product from the mine to rail in a way that met high-efficiency, low-contamination, and cold-weather-capable criteria.

Solurail stepped in to support a 'pit-to-rail' transloading solution for the mine's unrefined lithium ore.

Key challenges

Some of the major operational challenges addressed include:

- **Product handling & contamination:** spodumene is a bulk mineral, and maintaining product integrity (minimizing spillage, dust and contamination) is critical for downstream processing and customer specification.
- **Handling in extreme cold:** the mine and logistics facility operates in northern Québec, where cold-weather conditions that can reach –45°C and summer temperatures up to 40°C impose additional stresses on equipment, loading/transport processes, and worker safety.
- **Efficiency and payload-maximization:** moving heavy bulk material efficiently (truck, container, rail) to the railhead with minimal re-handling, reduced labour demands and short cycle times.
- **Flexible, intermodal logistics:** the need for a system that could interface between mine, storage/transload shed, rail gondola or container, and onward rail transport. Minimizing fixed bulk

infrastructure and enabling scalability.

- **Environmental/sustainability factor:** reducing spillage, dust loss, product loss, and minimizing the number of handling stages, thereby reducing labour, risk and environmental footprint.

Containerized bulk handling

Solurail chose a 'Containerized Bulk Handling' (CBH) approach, collaborating with specialist equipment partners RAM Spreaders and Intermodal Solutions Group (ISG).

Elements of CBH include:

- **Sealed bulk containers** from ISG for the bulk spodumene product to minimize re-handling, reduce contamination, and enable multimodal transfer (truck-to-container-to-rail).
- **Integration of a specialist rotating spreader** from RAM Spreaders, chosen for its track record, quality and after-sales support in bulk-handling applications.
- **Loading where containers are filled at the mine site or transload facility,** transported (by truck or rail) and then loaded into gondola railcars (the 'shed-to-rail gondola' loop). Solurail reports a payload of ~31 metric tonnes per container and ~93 tonnes per wagon in this configuration.
- **Equipment and process adaptations for cold-weather operations:** e.g., heating of equipment, winterized gear, and robust shelter/covering arrangements to keep the bulk product dry and free of snow/ice contamination.
- **The use of rail logistics as the core long-haul transport method** (leveraging Solurail's rail expertise) rather than pure trucking, thereby reducing transport cost per tonne and increasing capacity.

CBH implementation

The implementation yielded the following results as cited by Solurail:

- **Reduction in the number of handling stages:** from six stages to three in the 'pit-to-rail' loading loop, thereby reducing operational complexity and potential points of product loss.
- **Improved payload utilization:** with three containers filling one rail gondola, the process is faster, more efficient, and cleaner than traditional cargo unloading onto the ground, which uses an excavator to load the gondola.
- **Lower contamination/spillage:** by halving product loss and contamination risk, the system enhanced product integrity and quality assurance.
- **Cold-weather reliability:** the process continued at temperatures as low as -45°C without significant disruption thanks to adapted equipment and process design.
- **Environmental improvement:** Solurail reports 'spill-free loading' through deck design modifications and containerization, thereby improving environmental stewardship.

Strategic importance

From a strategic perspective, this case has several value-added dimensions:

- **For the mine/spodumene producer:** having a reliable, efficient logistics partner means improved supply-chain reliability, better product specification compliance, and reduced logistics risk (especially in remote, harsh conditions).
- **For Solurail:** the project positions the company as a specialist in high-value mineral logistics (lithium/spodumene), in a domain where supply-chain excellence is becoming a competitive

differentiator. Its 'innovation + rail logistics' stance helps raise its profile in North America.

- **For downstream users/battery supply chains:** while this case is "mine to rail" rather than refining, the integrity of the bulk material at this early stage helps reduce downstream processing risk, thus feeding into the broader "critical minerals" supply chain for electrification. Indeed, the mine project overview on the producer's website highlights its role in enabling logistics for the battery supply chain.
- **For sustainability and cost:** fewer handling stages, reduced spillage/dust means lower cost (both in direct losses and indirect clean-up/handling costs), and better environmental credentials — increasingly important in the mining/logistics sector.
- **Key learnings & transferable insights:** from this implementation, several broader lessons emerge that other bulk-minerals logistics projects (including container spreaders, gondola rail loops, transload sheds) can adopt:
- **Early partner selection matters:** choosing equipment suppliers (such as RAM Spreaders and ISG) with a proven track record and service support is critical for remote operations to minimize downtime.
- **Payload optimization is essential:** achieving higher tonnes per container and per wagon reduces the transport cost per tonne and improves the competitiveness of the mined product.
- **Environmental focus is not optional:** with growing scrutiny of mining & bulk logistics, solutions that reduce spillage, dust and re-handling align both cost and sustainability goals.
- **Containerized bulk handling works well for fine/fragile bulk minerals:** using sealed containers helps minimize dust, contamination and product loss — especially when switching from truck to rail or from mine to rail.
- **Cold-weather operations need special design:** equipment heating, shelters, and processes adapted for low temperatures can make the difference between a viable/fragile supply-chain and one with high risk.
- **Minimizing handling stages is a clear efficiency lever:** each additional handling stage adds cost, risk of loss, contamination, and fatigue. A design that cuts the stages (mine → container → rail) is more efficient and lower risk.

Testimonial

"Solurail was highly impressed by the quality of service provided during the acquisition of the RAM Revolver and the Containerized Bulk Handling system, particularly their after-sales support and technical expertise.

"This level of support enabled our organization to successfully execute large-scale transloading projects totalling several hundred thousand tonnes per year, even under extreme climate conditions ranging from over 40°C in summer to below–40°C in winter.

"Additionally, RAM Spreader delivered precise transloading operations with minimal dust generation, significantly reducing product loss and contamination risks while increasing the volume of material delivered to the final destination.

"Solurail is fully satisfied with this collaboration." — Benjamin Alexandre, President & CEO, Solurail Logistics Inc.

E-Crane takes scrap in its stride

E-Crane proves the clear choice for AMG Resources' new shear operation

AMG Resources boosts efficiency with Moros 1100 Shear and 700B E-Crane

Recently, AMG Resources — one of the world's largest processors and marketers of ferrous & non-ferrous scrap metal and a leading supplier of prime and secondary steel — completed a significant upgrade to its operations with the installation of a powerful 1100-ton Moros 1100 Shear. The team from AMG — headquartered in Pittsburgh, PA, USA — undertook an extensive evaluation of material handling solutions, ultimately selecting the E-Crane as the optimal choice, maximizing the shear's productivity.

Key highlights of the E-Crane installation

After thorough research and site visits, the AMG team chose the 700B Series E-Crane configuration, tailored to meet its specific material handling needs:

- **Model:** 700B Series E-Crane
- **Mount:** free-standing pedestal mount
- **Reach:** 86-foot / 26.2m reach
- **Attachment:** 1.63yd³/1.25m³ grapple
- **Function:** handles a wide range of materials efficiently

Superior operation and cost savings

The E-Crane's design offers immediate operational and financial advantages over traditional mobile equipment:

- **Maximum efficiency:** the crane is strategically positioned, allowing the operator to feed and control the

shear directly from the cab, maximizing throughput.

- **Enhanced operator environment:** the operator benefits from a high vantage point, providing excellent visibility and a comfortable, ergonomic, and climate-controlled environment.
- **Eliminated fuel costs:** the stationary, electric-powered design removes the need for diesel fuel, drastically cutting operating expenses.
- **Reduced maintenance:** being an electric machine, it eliminates the maintenance associated with diesel engines.
- **Increased yard space:** the fixed pedestal design frees up valuable yard space that would otherwise be required for mobile equipment travel lanes.

Why AMG chose E-Crane

The AMG team's decision came after witnessing the system's reliability at other E-Crane installations. "The simplicity, efficiency, electric power, and low cost of operation made the E-Crane a no-brainer."

The team concluded that the E-Crane is a highly regarded material handling solution that will serve the operation well into the future, confirming that the partnership with E-Crane "was the right choice."

Mazza Iron & Steel revolutionizes operations with E-Crane 700B

Mazza Iron and Steel, located in Fairless Hills, PA, USA, has acquired a 700B-Series crawler mount E-Crane to feed its shredder and pre-shredder. The E-Crane with its 105ft reach easily handles the chores of loading and clearing the pre-shredder and feeding the shredder all from one location.

The 700B Series E-Crane with its 105ft (31.7m) reach performs the tasks that would normally require as many as three mobile material handlers.

Interest in E-Crane was prompted by the installation of the pre-shredder at the Fairless Hills location. Mazza quickly realized that with the long outreach of the E-Crane, it would be possible to feed both the pre-shredder and shredder from a single location, something that could not be done with any other single material handler. Long outreach, high stockpiling ability, and excellent operator visibility into the shredder and pre-shredder are just some of the benefits Mazza has realized with the E-Crane. Additionally, the flexibility of the crawler mount allows Mazza to move the E-Crane around the shredder if needed depending on where the inventory is placed.

Mazza Iron & Steel also operates a larger 1000 Series E-Crane at its dock facility where it handles both stockpiling and loading chores of HMS, shredded and P&S materials for export. DCi

Telestack secures major contract

for a 'truck to ship' loading system for aggregate rock in Norway

Telestack has been awarded a significant contract to supply a fully customized 'Truck to Ship' aggregate loading system for Kvantum in Norway. This innovative project reinforces Telestack's leadership in providing innovative, client focused material handling solutions for another ports and inland terminal customer in Europe.

Purpose built to meet the customer's site requirements, the Telestack system consists of two truck unloading systems feeding a Link conveyor then to a TB 52 (170FT) radial telescopic shiploader operating at 2,500tph (tonnes per hour) handling aggregates (1.6t/m^3). Once commissioned, the shiploading system will load Handymax vessels, delivering a consistent, reliable and robust material handling process for the customer.

The customer and operator of the system will be 'Kvantum AS', which was first incorporated in May, 2010 with its main activities including chartering brokers, ship agents within coastal trade, along with dry bulk sale and distribution of aggregates throughout western Europe.

The project award was agreed in conjunction with Telestack's long-standing dealer representative in Norway — Fredheim Maskin which, for over ten years, has been a loyal and innovative partner with Telestack to develop market-leading products and customer focused after-sales support, which is critical for the overall success of this project and others in their region.

Robust and proven solution for a demanding application

The heavy-duty system is design to meet the characteristics of the material and site conditions, key features of the system include:

- **Direct loading to vessels from articulated dump trucks (ADT):** 45 tonnes payload to vessels allowing for an efficient shiploading process.
- **dual truck discharge for 2,500tph (tonnes per hour) loading capacity:** high capacity through ADT trucks for enhanced productivity and maximum efficiency.
- **Robust aggregate rock loading system:** handling 0–150mm (0–6 inch)

Norwegian rock at high capacity, this is testament to heavy duty design from the proven Telestack design.

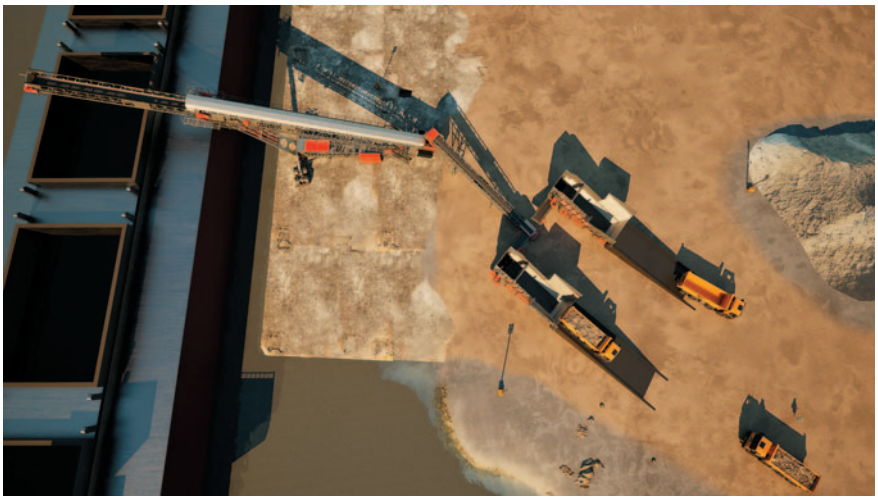
- **Utilizing the radial and telescopic features of the TB 52 Shiploader** will allow for an efficient loading system to trim the vessel hold and maintain production rates.
- **Rapid deployment system** which will be operational in less than nine months to ensure a 'quick' turnaround from 'Inception to Operation'.
- **Minimal infrastructure on site:** the site has minimal infrastructure to allow loading of the vessels, but the modular nature and limited civil requirements of the Telestack system allow for a seamless integration on site.

Strengthening Telestack's Global Project Portfolio

This latest contract highlights the continued trust placed in Telestack's engineering and project delivery teams by leading operators worldwide. The collaboration with Kvantum and the local representative — Fredheim Maskin — showcases Telestack's ability to engineer robust and high performance systems.

"We are delighted to be awarded this contract by Kvantum," said Carl Donnelly – International Sales Manager. "We greatly appreciate the trust shown by Kvantum in Telestack to deliver on this robust system. We understand the importance of this project for Kvantum are looking forward to going above and beyond to meet their expectations."

Stay tuned as this project moves through the Telestack design and manufacturing facility before dispatch for operation in Norway. DCi



Multilid® 2 enters service

The Multilid® 2 from CRS [Container Rotation Systems] has officially entered service, marking a significant advancement in containerized bulk handling (CBH).

In the third week of February this year, CRS celebrated another innovation that is set to transform the CBH industry.

Multilid® 2 is a fully adjustable lid lifting apparatus designed to accommodate any type of open top container lids currently in global circulation, in line with CRS's 'Any Lid — Any Time — Any Container' campaign.

This innovative, patent-pending, system allows for both transverse and longitudinal adjustments, enabling the handling of any container and lock system within Rotainers®.

Congratulations are due to Qube Ports, Port Kembla, Australia, on this remarkable achievement. In February 2026, the very first ship was loaded with three different variations in containers using this innovative technology.

Furthermore, the JH Tester Automation team also deserves great praise for their skill, patience, and professionalism with the integration of CRS's 2026 Rotainer Eurospec MH42 to facilitate full function integration with AAT's Liebherr LMH 550.

About Multilid® 2

Following a request for a solution that would work with a wide array of open-top containers currently on the market — including those with patented lid systems — CRS upgraded its successful Multilid®-1 to make it fully adjustable in both the

transverse and longitudinal axis. This allows the lid lifting frame to be easily adjusted in all directions and pinned in the appropriate position.

With CRS's proprietary 'Claw' lid lock manipulating apparatus, no lid or lock is beyond the reach of CRS lid lifting systems.

This solution enables Rotainers® to accommodate any lid on any container at any time, including CRS's newly introduced Ecotainer®, which is set to commence operations in Q2, 2026.

The Ecotainer® is a low-cost, uncomplicated concentrate container specifically designed for mining applications, capable of handling gross weights of less than 35,000kgs. It is ideally suited for CRS's Multilid® lid lifting systems.

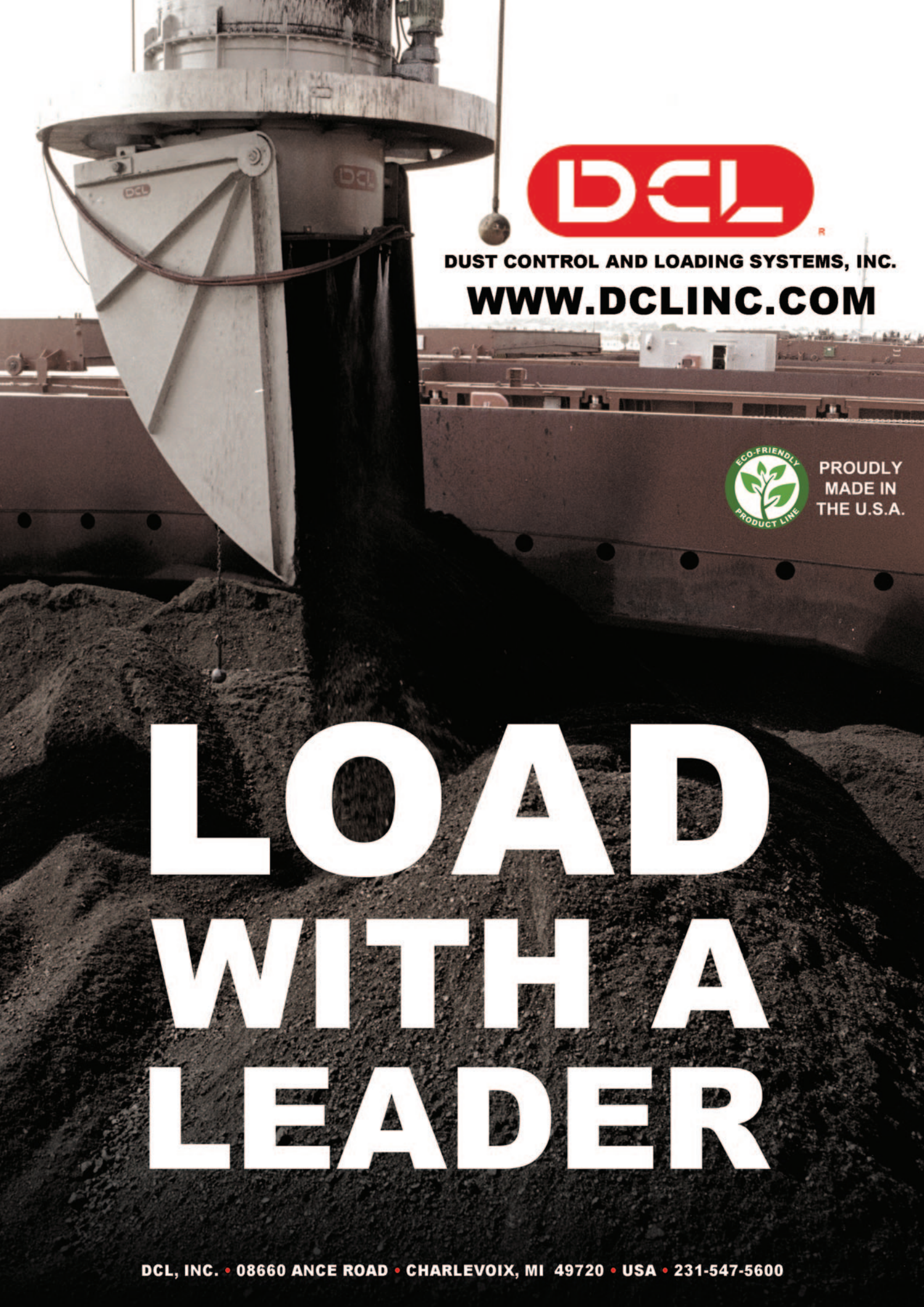
CRS stands out as the only manufacturer offering multiple lid lifting systems, opening up more industry opportunities and providing new economical options for the CBH industry, where dust free, environmentally friendly, open-top containers are essential.

About CRS

Australian company Container Rotation Systems (CRS) is renowned for its container-emptying system, which offers an efficient solution to the problem of unloading bulk from containers.

This is a concept that is gaining in popularity worldwide, and is in use internationally handling cargoes of vastly different properties, from alumina to coal.

The company remains very active, with its concept becoming ever better known. DCi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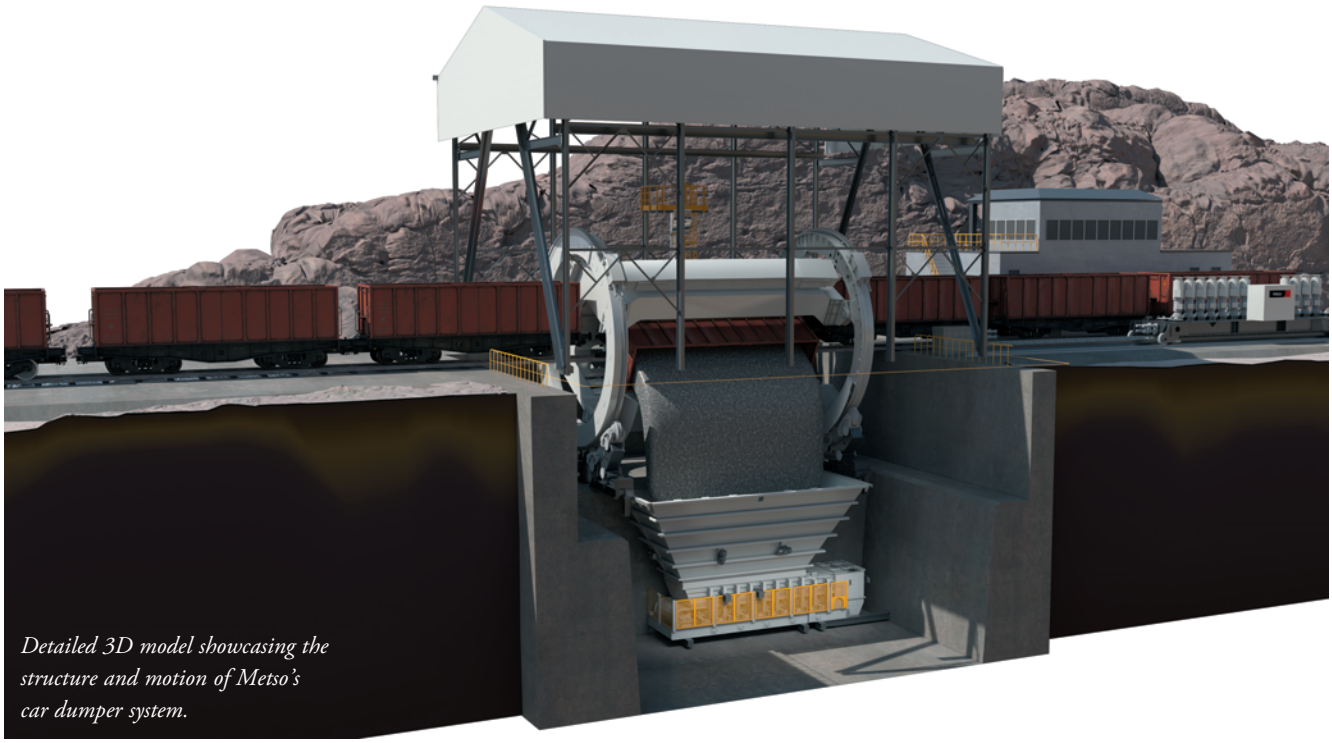
state-of-the-art coal handling systems ensure smooth operations

Metso's triple car dumper in operation at a customer site in China.

Louise Dodds-Ely

Strengthening coal handling performance through engineering, modernization and local expertise

Across some of the world's most coal-shipping intense port areas, customers often experience gaps in local support, engineering availability and responsive service for their bulk material flow systems and equipment, *writes Mateus Brugnerotto, Senior Product Manager, Railcar handling, Metso.* To address these challenges, Metso is strengthening its bulk material handling and port solutions offering through a significant and long-term expansion of its local presence close to customer



Detailed 3D model showcasing the structure and motion of Metso's car dumper system.

operations.

As part of its broader expansion of local expertise, Metso has recently expanded its North American presence with a new office in Pittsburgh, USA, now established as a dedicated hub for bulk material handling and port solutions expertise. Nearly 20 specialists are already on site, with plans to grow the team, advancing engineering capabilities and strengthening customer support across North and Central America. The Pittsburgh hub reinforces Metso's strategic goal to deliver world class service, faster response times and deep technical support exactly where customers operate. Located in one of the key regions for coal logistics, the new hub also enables Metso to better support coal operators seeking reliable unloading, conveying and stockyard performance. In addition to Pittsburgh, Metso is also preparing to launch another regional hub in the near future, further accelerating its global expansion and bringing critical expertise even closer to customers.

This expanded footprint strengthens Metso's ability to respond to the specific operational demands of coal terminals and power facilities, ensuring more accessible service and modernization support where high volume coal handling is central to day to day operations.

Global leadership in railcar dumpers and positioners

Coal terminals often depend on equipment capable of handling high volumes with precision, from single-car systems to tandem and triple dumpers handling up to ~10,000tph (metric tonnes per hour). Metso holds the world's largest installed base of dumper and positioner solutions —

Tandem car dumper featuring a rack-and-pinion train positioner (not visible in the photo).

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originally sold under the Svedala, McDowell Wellman, Dravo Wellman and Strachan & Henshaw brands. The company provides complete end-to-end solutions, from designing and manufacturing the equipment to supplying, erecting and delivering full lifecycle support for both its own dumpers and those from other OEMs. Among these services are turnkey dumper barrel replacements, offering a fully engineered and installed solution for extending asset life. Each system is engineered using state-of-the-art fatigue and stress analysis to ensure long-term performance in heavy-duty port environments.

Modernizing systems for long-term stability

In coal handling, where material properties can range from dry and free flowing to wet, frozen or highly abrasive, equipment modernization becomes especially critical to ensuring stable performance. Coal often creates challenges such as material build up, inconsistent flow and accelerated wear on contact and transfer surfaces, issues that are well documented across coal terminals and power-generation sites. These conditions place additional stress on key functional elements such as dumper clamps, rotation mechanisms, drive systems and feeders, making targeted upgrades essential to maintaining reliability and throughput.

Metso's upgrade options are designed to fit different layouts and operating conditions, with the aim of helping operators maintain predictable performance without requiring full system replacement. The focus is on practical improvements that influence reliability, safety and ease of maintenance over the equipment's lifecycle. A range of upgrade options is available to address site specific conditions and operational requirements, reinforcing Metso's long-term commitment to supporting customers across the full bulk material handling lifecycle.

In coal applications, these retrofit solutions help address issues such as ratholing, bridging, moisture-driven blockages and increased component wear under high-capacity operation, while Metso's evaluation and support services, including inspections, optimization studies, field service support and Life Cycle Services, help operators maintain stable performance over time.

- **Inspections:** available as quick visual checks or more detailed assessments of specific components and assemblies.
- **Optimization studies:** used to analyse cycle times, evaluate retrofit benefits, and estimate remaining equipment life to support planning and budgeting.
- **Field service support:** access to trained specialists for installation, repairs, and troubleshooting as needed.
- **Life Cycle Services:** structured service programmes combining parts supply, maintenance planning, and process related support based on site requirements.

Metso's positioner with an integrated last-car arm, on a Chinese coal dumper.

These services are particularly valuable in coal operations, where fluctuations in moisture, temperature, and particle characteristics can influence system behaviour over time. Through regular assessments and targeted upgrades, operators can maintain both flow consistency and equipment reliability, even when handling frozen coal, fine fractions or highly abrasive feedstocks.

Advancing #1 automation leadership

Aligned with Metso's commitment to end-to-end bulk and port solutions, the company recently announced the acquisition of MRA Automation, an engineering company based in Australia. MRA Automation specializes in providing engineering, automation and software solutions for bulk material handling operators and is a leading provider of automation and digitalization technology solutions for ports and terminals worldwide. As a result of this acquisition, customers will benefit from integrated and advanced technologies designed to enhance efficiency, safety and support throughout every stage of bulk material handling operations.

In addition to its broad bulk-handling expertise, MRA Automation has a strong track record in automating high-throughput export chains for commodities such as coal, particularly at major Australian port corridors. Their systems support ship loaders, stacker reclaimers and long conveyor networks used by global terminal operators managing coal and other bulk commodities, enabling precise machine sequencing, advanced safety logic and real-time condition monitoring. This deep understanding of coal-specific operational conditions further strengthens Metso's ability to deliver reliable, high-performance solutions tailored to the needs of coal terminals and stockyard operations.

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Coal handling in transition: engineering cleaner and more efficient bulk transfer

Coal continues to occupy a central position in global dry bulk logistics. Despite long-term decarbonization strategies in many regions, the material remains indispensable to steelmaking, cement production and power generation, particularly across Asia, Africa and parts of Eastern Europe. From export terminals and inland ports to rail-linked power plants, coal accounts for a substantial share of bulk solids moved each day, placing sustained pressure on handling infrastructure to deliver high throughput while meeting increasingly strict environmental and safety expectations.

The scale of coal movements brings distinctive operational challenges. Unlike many agricultural bulks, coal is highly abrasive and prone to generating fine dust during transfer. Spillage and airborne particles affect not only product loss and housekeeping, but also regulatory compliance and workforce safety. At ports and railheads, where transfer rates must remain high to avoid bottlenecks, operators face the dual task of maintaining productivity while limiting emissions that may drift beyond site boundaries. These competing demands are reshaping investment priorities in bulk handling equipment, with renewed attention on controlled loading technologies.

Dust control has become a defining issue. Coal fines released during loading can settle on mechanical components, accelerate wear and contaminate surrounding areas. Over time, this increases maintenance frequency and heightens the risk of unplanned downtime. Environmental permitting frameworks in many countries now impose specific limits on particulate release during bulk transfer, making traditional open-chute loading methods increasingly difficult to justify. As a result, terminal operators are turning to enclosed or semi-enclosed systems designed to stabilize the material stream from discharge point to wagon, truck or barge hold.

Among these technologies, telescopic loading bellows have assumed a more strategic role. Once regarded as ancillary equipment, they are now positioned as a primary interface between conveying systems and transport units. By extending into the receiving vessel and forming a controlled discharge channel, loading bellows reduce the free-fall distance of coal and limit turbulence within the flow. This approach addresses several operational pain points simultaneously, cutting dust formation, improving loading accuracy and supporting compliance with site emission targets.

Within this segment, TOREX loading bellows exemplify how engineering design is adapting to the evolving coal market. Developed as part of WAMGROUP's bulk solids portfolio, the systems are intended for high-duty applications where abrasive materials and variable loading geometries are the norm. Their configuration typically combines wear-resistant fabrics with internal cones or liners that guide the coal stream while protecting the bellows structure from direct impact. External hoisting mechanisms keep lifting components out of the material flow, reducing contamination and prolonging service life in dusty environments.

For coal terminals handling rail wagons or barges, alignment and reach are equally

critical. Variations in wagon hatch positions or barge hold profiles can lead to misdirected loading and spillage if the discharge point cannot be accurately positioned. Motorized positioning carriages and extended-stroke bellows have therefore become important features in modern installations. These allow a single loading point to serve multiple compartments without repeated vehicle repositioning, improving turnaround times while maintaining consistent discharge conditions.

Environmental performance increasingly shapes equipment selection. Integrated dust collection options, mounted directly at the bellows head, are designed to extract displaced air from the receiving vessel and filter entrained particles before release. This localized approach avoids the need for extensive return-air ducting and is particularly suited to retrofit projects, where space constraints often limit the feasibility of large external filters. In coal handling, where dust loads are high and moisture content can vary, such compact solutions offer a practical route to improved containment without major civil works.

The market context for these developments reflects wider trends in bulk logistics. Sustainability targets are encouraging operators to invest in cleaner transfer systems, even in sectors traditionally associated with high emissions.

At the same time, much of the world's coal infrastructure is ageing. Many terminals were designed decades ago for open loading practices that are no longer acceptable under current environmental rules. Modernization projects therefore tend to focus on upgrading the transfer interface rather than replacing entire conveying lines. TOREX Loading bellows systems, with their modular construction and adaptable mounting options, fit well within this approach. They can be installed above existing discharge points and configured to match different wagon or vessel types, allowing incremental improvements without extended shutdowns.

Regulatory pressure on dust control shows little sign of easing. Urban expansion around ports and inland terminals has increased scrutiny of visible emissions, while occupational health standards continue to tighten. In this context, the role of engineered discharge systems is shifting from optional enhancement to essential infrastructure. Coal operators are expected to demonstrate not only that material can be moved efficiently, but that it can be done with due regard for environmental impact and workforce protection.

Looking ahead, the handling of coal is likely to remain a test case for the bulk solids industry's ability to balance throughput with responsibility. Although long-term energy strategies may alter the overall demand profile, current volumes ensure that coal will continue to challenge designers of transfer equipment for years to come. Advanced loading technologies, such as telescopic bellows with integrated dust control and automated positioning, offer a means of reconciling these pressures.

By stabilizing the discharge stream and enclosing the critical transfer zone, such systems help reduce emissions at source rather than relying solely on downstream mitigation. In doing so, they support a more controlled and predictable loading process, aligning operational efficiency with environmental objectives. For plant managers and terminal operators navigating an increasingly regulated landscape, this convergence of productivity and compliance is fast becoming the defining criterion for investment in bulk handling solutions.

AUMUND Group: integrated solutions for the global coal industry

The AUMUND Group is a trusted global bulk material handling partner to the coal industry, offering one of the most comprehensive product portfolios and delivering complete, fully integrated bulk material handling solutions tailored to customer-specific requirements, *writes Jens Pöpperling, Head of Global Sales, AUMUND Holding B.V.* With installations worldwide across mining, steel, cement, fertilizer and other heavy industries, the Group provides advanced conveying, storage and loading technologies adapted to regional market needs.

AUMUND Fördertechnik: Comprehensive Conveying Solutions

AUMUND Fördertechnik offers an extensive range of conveying equipment specifically engineered for a wide variety of materials as well as for coal handling operations. The product portfolio includes belt bucket elevators (BWG type) with steel cord belts operating at temperatures up to 150°C, chain bucket elevators (BWZ type) for coarse, hot or abrasive materials achieving capacities over 900m³/h, and double chain bucket elevators (BWZ-D type) for high-capacity applications exceeding 1,800 m³/h with centre distances over 90m.

One of AUMUND's latest innovations, the patented Push Chain Bucket Elevator, represents a significant technological advancement in vertical conveying. The Push Chain Bucket Elevator is driven from ground level, offering easy maintenance, lower energy consumption and adjustable capacity with a lighter structure and enhanced operational safety. This technology can also be used in mobile applications for stackers or shiploaders.

AUMUND's KZB-type pan conveyor.

Pan conveyors form another critical element of AUMUND's handling solutions. The KZB-type pan conveyor reliably transports hot and abrasive materials, whilst the bucket apron conveyor (BZB type) handles inclined conveying routes up to 60° with capacities to 500tph (tonnes per hour). All systems ensure reliable performance in demanding coal and other material applications.

AUMUND's Samson Material Feeders provide controlled material reception directly from trucks, rail wagons or loaders. Available in both fixed and mobile configurations, these units combine the strength of apron feeders with belt cleanliness, offering buffer capacity and controlled discharge to downstream

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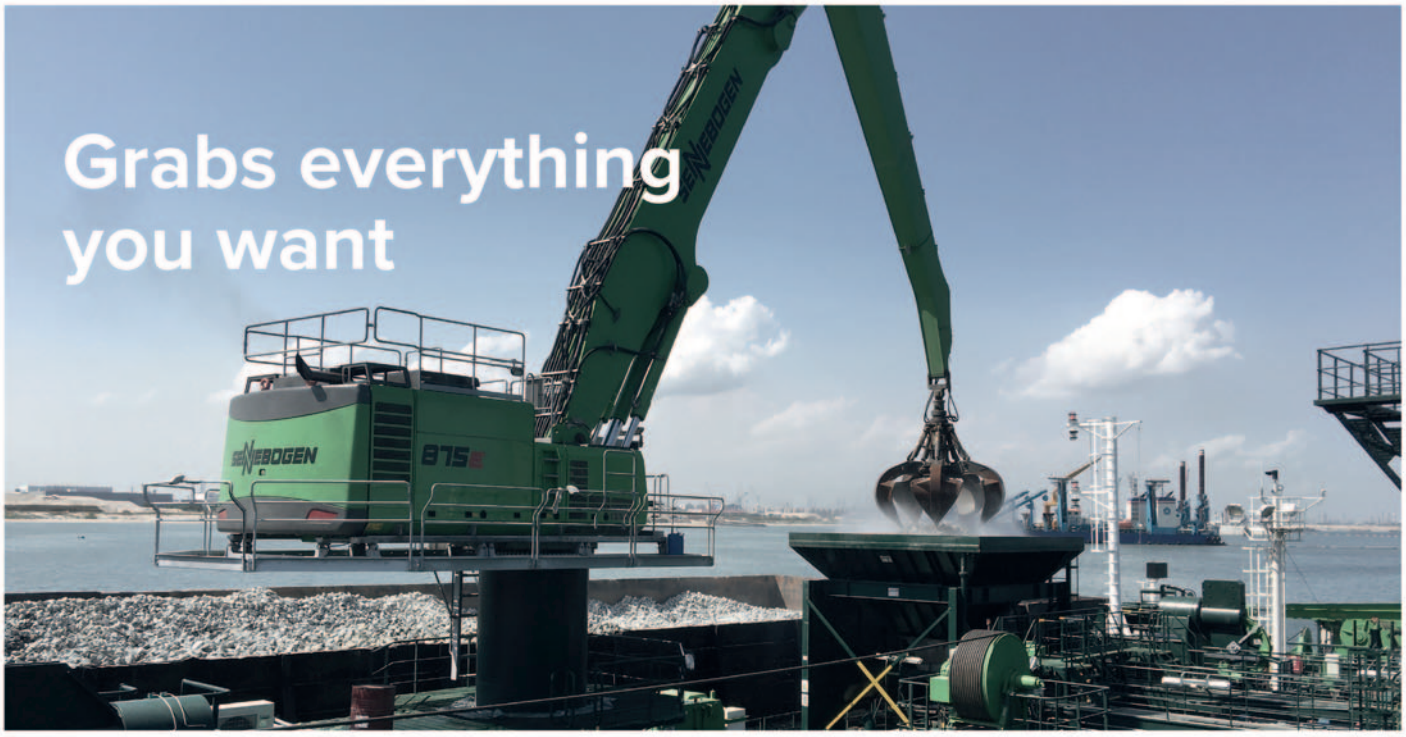

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handling equipment.

SCHADE Lagertechnik: advanced stockyard and port technology

SCHADE Lagertechnik specializes in stockyard and port solutions for bulk materials, delivering longitudinal and circular storage systems with high-performance stacking and reclaiming equipment, complemented by wagon unloading systems and rail-mounted shiploaders. For coal applications, the stockyard portfolio includes portal, semi-portal, bridge-type and cantilever scraper reclaimers, tailored to specific stockyard layouts. Circular storage systems achieve high stacking and reclaiming capacities, ensuring efficient material handling and effective coal homogenization.

For challenging materials exhibiting poor flow characteristics, SCHADE's Active Harrow technology activates stockpiled coal to ensure consistent reclaim rates. This technology has proven particularly valuable in power station applications where maintaining specified throughput and homogenization requirements is critical. SCHADE also supplies wagon tipplers for efficient rail car unloading, completing the coal and other bulk material receiving infrastructure.

SCHADE portal scraper-reclaimer.

SAMSON Materials Handling: mobile port solutions

SAMSON Materials Handling delivers mobile equipment for coal terminals and multi-user ports. The product range comprises Samson Material Feeders for truck reception, mobile shiploaders for vessel loading up to 2,000tph, Stormajor radial stackers for stockpiling and barge loading, and Eco Hoppers for dust-controlled vessel discharge.

The mobile shiploader features comprehensive trimming equipment including cascade chutes, variable speed radial throwers and radial distributors. Loading booms incorporate three-roll troughing idlers for maximum rigidity, whilst remote control enables operators to monitor trimming operations directly. Systems can be mounted on single or double Samson Material Feeders, creating fully integrated mobile units.

The Eco Hopper feature advanced air filtration rather than water suppression for dust control during bulk discharge operations. Rail-mounted configurations serve grab crane operations, whilst mobile versions provide flexibility across multiple berths.

The Stormajor combines material reception with radial stacking capabilities

SAMSON Material Feeder.

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on wheeled or tracked chassis. This tracked mobile portfolio, including the new BF0415T Stormajor Boom Feeder, offers fast setup and operational flexibility particularly valued in port environments handling multiple commodities.

TILEMANN: ENGINEERED CHAINS AND COMPONENTS

TILEMANN specializes in precision-engineered conveyor chains and components for bulk materials handling systems. The portfolio includes forged steel chains, cast chains and engineered class chains designed to withstand the abrasive nature of coal and the mechanical stresses of continuous operation. TILEMANN components extend service life and reduce maintenance intervals, complementing the Group's systems capability with premium replacement parts and upgrade solutions for both AUMUND and third-party equipment.

ESI EUROSILO: VERTICAL STORAGE TECHNOLOGY

In June 2025, AUMUND integrated ESI EUROSILO, adding vertical silo storage technology to the Group portfolio. ESI's systems serve multiple sectors including energy, agriculture, food processing and mining.

For coal operations specifically, EUROSILO's circular storage systems offer proven performance at coal-fired power stations and export terminals. The technology stores materials including coal, petroleum coke and FGD gypsum. Combined with AUMUND's conveying expertise, this creates integrated solutions optimizing throughput from stockpile to vessel loading whilst meeting stringent dust control requirements.

EUROSILO systems feature compact footprints, high reliability and automated operation.

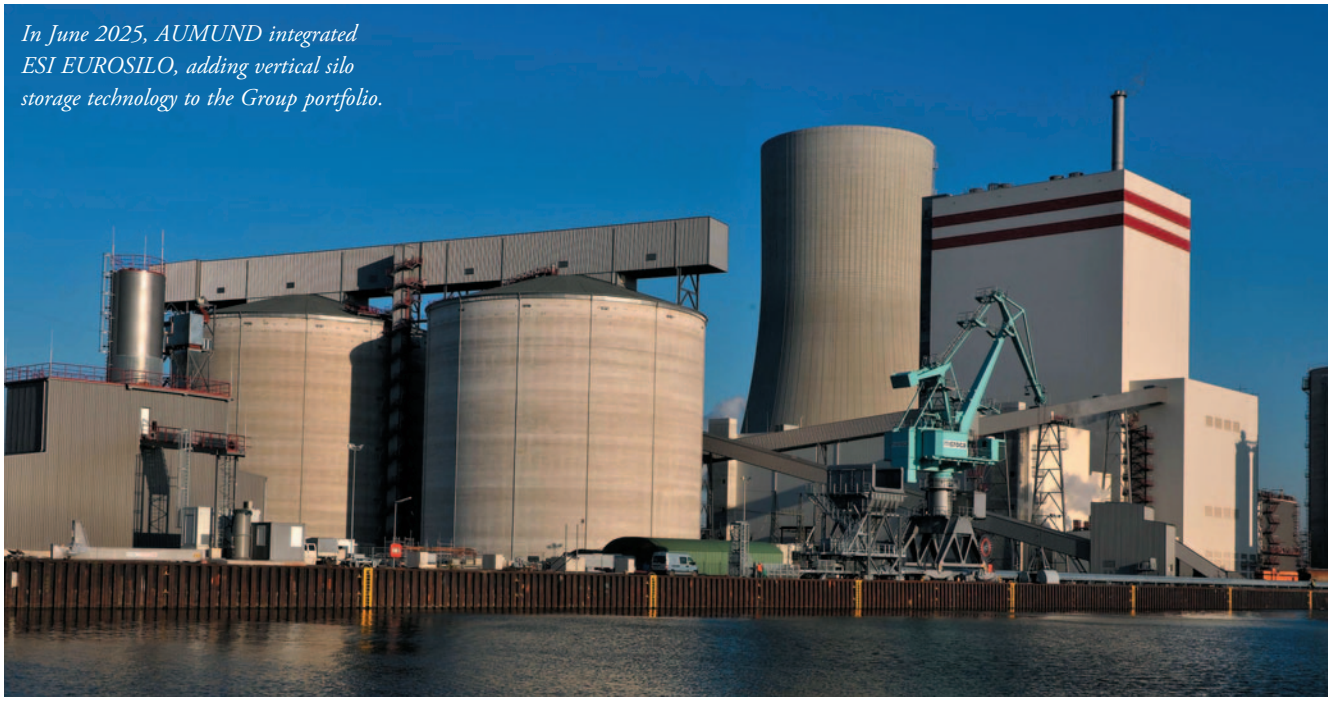
SERVICE AND SUPPORT INFRASTRUCTURE

The AUMUND Group's PREMAS 4.0 predictive maintenance system provides digital monitoring of real-time and historical data, enabling customers to address issues before costly shutdowns occur. Extensive after-sales and spares

SAMSON Eco Hopper.

TILEMANN precision-engineered conveyor chains.

Silo storage with ESI Eurosilo.



In June 2025, AUMUND integrated ESI EUROSILO, adding vertical silo storage technology to the Group portfolio.

warehouses around the world, coupled with technical support from global and local teams, ensure parts availability.

The Group's conversion business revitalizes existing equipment from any manufacturer, often upgrading throughput or extending asset life. This capability spans the complete equipment range including belt and chain elevators, pan and bucket conveyors, and plate feeders, representing significant value for operators seeking to maximize existing infrastructure.

With a comprehensive product portfolio spanning AUMUND Fördertechnik's conveying systems, SCHADE Lagertechnik's stockyard equipment, SAMSON Materials Handling's mobile solutions, EUROSILO's storage technology and TILEMANN's chain components, the AUMUND Group delivers complete and integrated handling solutions and is thus the perfect material handling partner for the coal and many other industries.

Moving the world's bulk materials: how ASGCO delivers complete conveyor solutions for coal and beyond

Coal remains one of the most heavily handled dry bulk commodities on the planet. From mine to port to power station, vast tonnages move every day, placing relentless demands on conveyor systems. Yet coal is only part of a much larger story. The same challenges that define coal handling, abrasion, dust, spillage, and nonstop operation are shared across the global bulk handling industry. At the intersection of these demands stands ASGCO Complete Conveyor Solutions,

delivering engineered products and services that keep bulk materials moving safely and efficiently, whatever the commodity.

Founded in 1971 and headquartered in Nazareth, Pennsylvania, USA, ASGCO has spent more than five decades immersed in the realities of conveyor performance. What began as a component supplier has evolved into a full-service conveyor solutions provider serving coal, aggregates, cement, minerals, ports, power generation, and industrial bulk handling operations worldwide. This breadth of experience gives ASGCO a unique advantage. Lessons learned in high-tonnage coal applications often drive innovations that benefit the wider bulk handling sector.

Where coal sets the pace

Coal handling systems are unforgiving. Belts run longer, loads are heavier, and downtime is costly. ASGCO's equipment portfolio is engineered with these conditions in mind. Conveyor belt cleaners, impact beds, skirting systems, belt trackers, pulley lagging, and wear liners are designed to perform in abrasive, high-throughput environments where failure is not an option.

Belt cleaning is a prime example. In coal operations, carryback can lead to fire risk, excessive cleanup, and accelerated component wear. ASGCO belt cleaners are designed to deliver consistent, aggressive cleaning while protecting the belt itself. These same solutions are now widely used in aggregate plants, mineral processing facilities, and bulk terminals, proving that technology refined in coal can raise performance standards across the industry.

Transfer points are another critical battleground. Uncontrolled material flow leads to dust clouds, spillage, and structural damage. ASGCO impact beds and sealing systems stabilize the belt, absorb impact energy, and contain material at the source. The result is cleaner, safer, and more efficient operations, whether handling coal, iron ore, limestone, or fertilizer.

More than equipment: intelligence in the field

What truly sets ASGCO apart is the integration of equipment with real-world service. The company's inspection and conveyor service programmes are built around understanding how bulk handling systems operate day after day. ASGCO technicians conduct conveyor inspections, belt cleaner audits, and transfer point evaluations, identifying performance gaps and recommending targeted improvements. These services are especially valuable in coal handling, where ageing infrastructure often must meet modern safety and environmental expectations. However, the same expertise supports ports, processing plants, and storage facilities handling a wide range of bulk materials. By combining engineered products with field-proven service, ASGCO delivers solutions that work beyond the drawing board.

Serving a global and diverse industry

ASGCO's customer base reflects the full spectrum of bulk handling. Coal mines and preparation plants, power stations, export terminals, aggregate producers, cement plants, mineral processors, and industrial facilities all rely on ASGCO solutions. Through a global network of representatives and partners, the company supports operations across North America and international markets, providing consistent engineering quality with local support.

This cross-industry reach allows ASGCO to stay ahead of market trends. As bulk handling operators demand greater efficiency, lower maintenance, and improved environmental performance, ASGCO responds with solutions informed by decades of experience across multiple industries.

Innovation driven by real world demands

Innovation at ASGCO is not driven by theory alone. It is shaped by the realities of coal mines, ports, and processing plants. Recent developments include advanced wear-resistant blade materials, modular

Motor Driven Reels
- Monospiral and Level-Wind configurations
- Rugged and dependable magnetic coupler for dusty environments

Cable Festoon
- Corrosion-resistant, long-life rollers; precision sealed bearings
- Systems customized for the application
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Conductix-Wampfler has one critical mission: To keep your bulk material handling operations running 24 / 7 / 365. You need proven, worry-free energy solutions - and Conductix-Wampfler has them. Our systems provide reliable electric power and water to stacker/reclaimers, barge and ship loaders/unloaders, bulk conveyors, tripper systems, and gantry cranes. Conductix-Wampfler systems are rugged, low maintenance, and time-tested in tough, dusty environments. All products are backed by the largest sales and service network worldwide!

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skirting systems that reduce installation and maintenance time, and enhanced belt tracking solutions for wide and high-speed conveyors. These advancements improve performance in coal handling while delivering clear benefits for other bulk commodities.

Customization remains a cornerstone of ASGCO's approach. Every material behaves differently, and every conveyor presents unique challenges. ASGCO engineers systems tailored to specific applications, ensuring reliable performance whether handling coal, copper concentrate, grain, or recycled materials.

Building safer, cleaner, and more sustainable operations

Across the bulk handling industry, safety and sustainability are no longer optional. ASGCO solutions are designed to reduce dust emissions, control spillage, and improve access for maintenance and inspection. Cleaner conveyors mean safer workplaces, lower cleanup costs, and improved regulatory compliance.

By extending belt life and reducing material loss, ASGCO also helps operators lower energy consumption and waste, supporting more sustainable bulk handling operations in coal and beyond.

A partner for the future of bulk handling

Coal may set the benchmark for demanding bulk material handling, but the lessons learned reach far beyond a single commodity.

With more than 50 years of experience, ASGCO Complete Conveyor Solutions continues to help the global bulk handling industry move materials smarter, safer, and more efficiently. From coal mines to ports and processing plants, ASGCO remains focused on one mission: delivering complete conveyor solutions that perform where it matters most.

Coal handling technology designed to support a market in flux

With coal remaining a mainstay in power-generation and its industrial substitution a challenge, ports continue to need ship-unloading technology that sustainably handles coal and is ready for greener transitions.

Coal markets continue to develop in response to changing weather patterns, fuel prices and policy decisions. According to the International Energy Agency (IEA), global coal demand in 2025 was expected to rise slightly, by around half a percent, reaching a record 8.85 billion metric tonnes.

While long-term forecasts indicate that demand will gradually plateau and begin to decline towards the end of the decade, coal remains an essential fuel and raw material for power generation, steelmaking, cement production and chemical processing in many parts of the world.

China alone consumes more coal than the rest of the world combined. India continues to expand coal capacity to meet growing electricity demand, while Southeast Asia represents the fastest-growing coal market globally, notes the IEA. At the same time, substitution away from coal in industry, such as steelmaking, is slow. Against this backdrop, coal handling continues to be both a critical requirement and a significant challenge for dry bulk operations in ports terminals.

A demanding bulk

Coal is far from a uniform commodity. Thermal coal, coking coal and coal used for gasification vary widely in density, abrasiveness, moisture content and fines. Quality can also fluctuate significantly, with higher moisture levels, increased stickiness and greater contamination a common occurrence. These characteristics place increasing pressure on bulk handling equipment and overall operational efficiency.

High moisture content, sticky coal increases the risk of blockages and inconsistent discharge rates. For operators, this can result in longer discharge times, reduced berth productivity and higher operational and demurrage costs.

For decades, coal has been one of the most frequently handled bulk materials by Siwertell screw-type ship-unloaders. It is a technology that continues to meet the challenge of handling all types and qualities of coal, offering proven reliability, high through-ship efficiency and unmatched environmental performance.

A notable pair, early in their service lives, are two large-scale Siwertell ST 790-D-type ship-unloaders commissioned for an ultra-supercritical power station in southern China. They are rail-mounted and offer a continuous rated coal handling capacity of 1,800t/h, with a peak capacity of 2,000t/h, discharging vessels of up to 100,000 dwt.

Efficiency beyond rated capacity

The efficiency of Siwertell ship-unloading technology is defined by comparing the actual through-ship unloading capacity against its rated capacity. A grab crane, for example, offers efficiencies of between 50% and 60%, and in comparison, totally enclosed Siwertell screw-type ship-unloaders deliver efficiencies of 70% or more.

Calculations include all movements between the different holds down to a machine clean level. For example, a performance test was carried out with two Siwertell unloaders, each with a rated capacity of 2,200tph (tonnes per hour), discharging an 80,000dwt vessel fully loaded with coal. The unloaders delivered an average capacity above 77%.

Advantages of continuous unloading

The efficiency advantage of Siwertell technology lies in its continuous unloading capabilities; a steady discharge rate is maintained regardless of cargo level in the vessel hold.

With grab cranes, productivity is highest at the beginning of an operation, when travel distances are short and the grab fills easily. As the cargo level drops, travel distances increase, fill factors decline and efficiency progressively decreases. Performance drops even further during final clean-up.

A Siwertell ship-unloader avoids this pattern. Its conveying arm can reach under hatch coamings and deep into the corners of the hold, maintaining a consistent

unloading rate from the first tonne to the last. This capability contributes directly to higher average through-ship capacities and improved terminal profitability.

Environmental pressure intensifies

Coal handling is under increasing environmental scrutiny. Dust emissions, spillage and noise pollution are no longer acceptable at many ports, particularly those located near urban or environmentally sensitive areas.

Despite their long history, grab cranes offer no material containment and can spill up to two percent of cargo during unloading. Spilled coal represents wasted material, additional clean-up costs and increased environmental risk.

Siwertell ship-unloaders are totally enclosed from the point where material is collected below the cargo surface through to the transfer points on the jetty conveyors. This design eliminates spillage and virtually all dust emissions.

Other continuous unloading systems, such as chain unloaders, are enclosed but cannot withstand high digging forces, making them less suitable for compacted or sticky materials. Siwertell conveying systems combine full containment with the mechanical robustness needed to handle abrasive, sticky and compacted cargoes.

Steel industry applications

Coal remains indispensable to steelmaking. In this arena, Siwertell secured a landmark contract with Formosa Petrochemical Corporation (FPC) for two large ST 940-DOB unloaders to serve the Ha Tinh steel complex in Vietnam.

These rail-mounted units, each rated at 2,400tph, serve vessels up to 205,000 dwt and provide a combined capacity of 4,800tph. The complex has an estimated annual coal intake of 7.8 million metric tonnes, supplying both blast furnaces and an associated 2,150MW coal-fired power plant.

During the design phase, extensive modelling addressed challenges such as sticky coal with high water and clay content. Careful material selection and chute design have ensured reliable performance, with early tests confirming excellent energy efficiency and rated capacity results.

Supporting fuel transitions

One of the most distinctive capabilities of a Siwertell ship-unloader is its ability to support power stations transitioning from coal to biomass. Co-firing and full biomass conversion place significant demands on unloading systems. Biomass has roughly half the density of coal and around two-thirds of its calorific value, requiring significantly higher volumes to achieve the same energy output.

Moreover, biomass pellets are fragile, dusty and prone to self-ignition. Siwertell ship-unloading technology is unique. It offers steady conveying velocities, which preserves pellet integrity, minimizes dust generation and reduces fire risk. It is also the only high-capacity, continuous ship-unloader capable of handling biomass and volatile dry bulks safely in an enclosed conveying system.

Power stations in the UK, Denmark, Singapore and across Asia, where Siwertell unloaders were originally installed for coal, now handle large volumes of biomass as part of renewable energy transition strategies.

Designed for long-term value

Selecting a ship-unloader is a long-term investment decision. Operators must consider operating efficiency, personnel requirements, power consumption, maintenance, reliability and environmental compliance over decades of service.

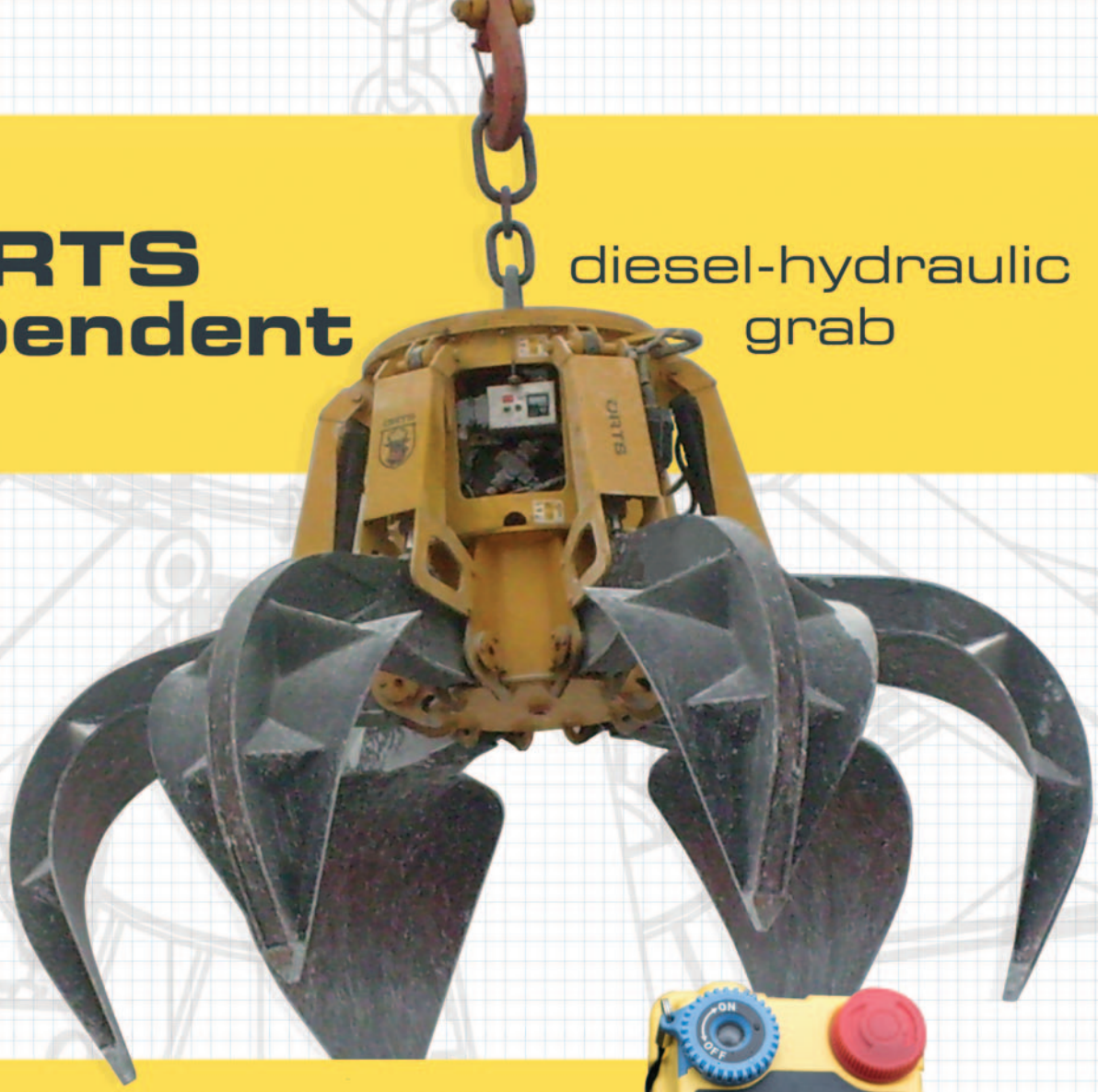
Siwertell unloaders typically require only one operator, offer low power consumption and minimize vessel time at berth through consistently high discharge rates.

Their low weight design and narrow rail spans reduce jetty construction costs and often avoid the need to strengthen existing port infrastructure.

The role of coal in the global landscape is still prevalent and changing, making efficient, adaptable handling systems essential .Wherever coal remains a critical part of operations, Siwertell technology continues to set the dry bulk handling benchmark.

ORTS independent

diesel-hydraulic grab



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Conveyor dust best practices at transfer points

It doesn't matter if it's from a silo, hopper, or another conveyor; when dry bulk material is dropped onto a moving conveyor belt, dust emissions are inevitable, right?

Not necessarily, writes *Jerad Heitzler, Training Manager / Martin Engineering*.

The moving belt, even when empty, pulls air through the enclosure in the direction it is moving. When the material hits the belt, the impact causes the cargo to splash, particulates to become airborne, and the subsequent air turbulence forces the dust emissions toward the nearest opening. Without a sealed environment that controls airflow, the poor air quality creates a serious workplace safety hazard. [Fig.1]

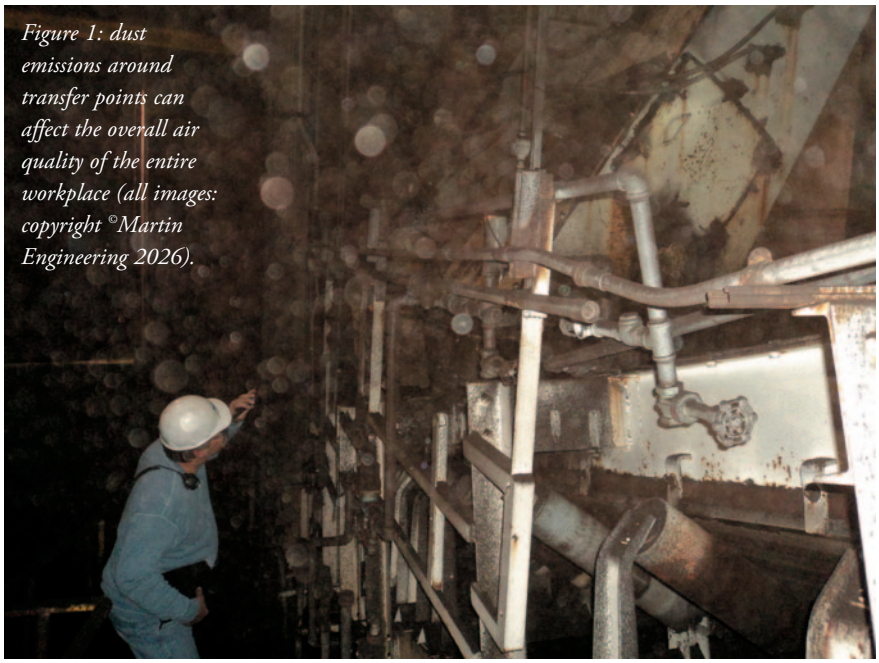

Figure 1: dust emissions around transfer points can affect the overall air quality of the entire workplace (all images: copyright ©Martin Engineering 2026).

Dust emissions don't just create a harmful environment for those working in the area. Abrasive particulates make their way into exposed machine parts and rolling components, causing them to wear quicker, seize and require replacement sooner. Dust clogs air intakes of nearby equipment and vehicles, raising the amount of downtime and maintenance. Particulates cover walkways, stairs, and control units and obscure signage. And there are serious environmental concerns and increased complaints from nearby communities that trigger inspections from authorities.

The U.S. Occupational Safety and Health Administration (OSHA) and the U.S. Mine Safety and Health Administration (MSHA) over the years have targeted efforts to improve air quality through greater scrutiny followed by steep fines. Regardless of operators' opinions of these measures, they have successfully helped to reduce the number of illnesses and chronic lung diseases associated with fugitive dust emissions.

Often at issue is many operators' lack of understanding of the underlying causes of dust. Most solutions focus on dust suppression and collection, but decades of field study and experience have shown that, to control air quality at transfer points, it is more beneficial to address the root causes by taking a holistic view of the function and design of the material transfer process.

Elements of a transfer chute

A transfer chute should have several key components that mitigate material spillage and dust, allow the cargo to settle on the belt's centre, and facilitate the settling of dust either back into the cargo flow or into a dust collection mechanism. These components include cradles, wearliners, skirting, raised enclosures, and strategically placed dust curtains. [Fig.2]

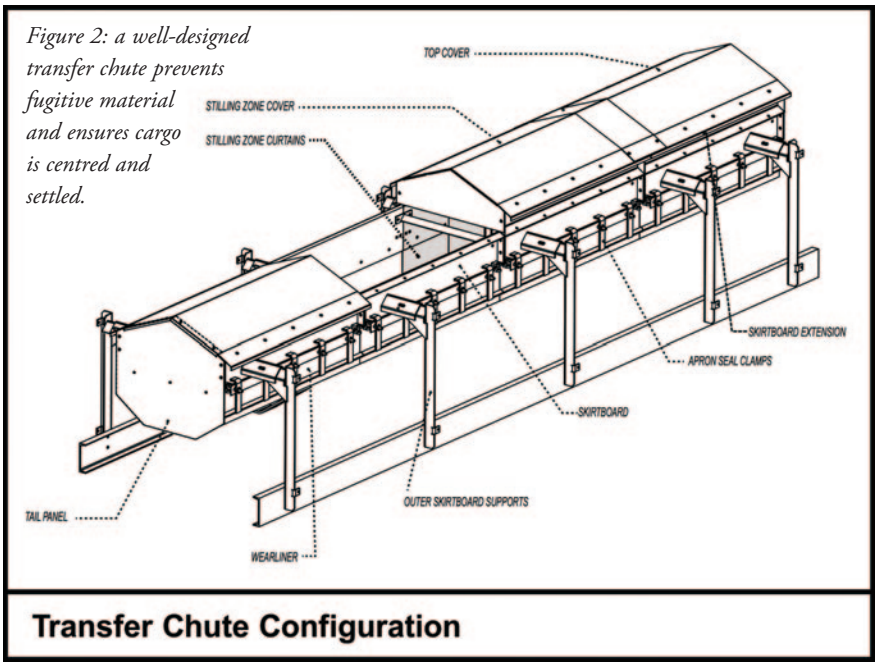

Figure 2: a well-designed transfer chute prevents fugitive material and ensures cargo is centred and settled.

Some manufacturers offer modular transfer chute enclosures that can be quickly and economically retrofitted for changes in production during scheduled downtime. Extending the transfer chute enclosure provides more space for the turbulent air and dust to settle. Externally facing wearliners and skirting allow easy access for significantly safer maintenance. Although the normal lock-out/tag-out procedures are required, external servicing eliminates the need for chute entry and drastically reduces the amount of downtime.

Nuisance vs. respirable dust

If you can see the particulates floating in the air, they aren't small enough to be respirable, meaning they don't surpass the body's natural defenses and enter deep into the lung, causing serious damage and health issues. Nuisance particulate matter (PM) smaller than 200µm (micrometers in diameter) — roughly the size of normal household dust — is light enough to remain airborne on ambient air currents. It settles on every surface and causes serious abrasion in rolling and mechanical components.

When PM reaches 100µm — approximately the size of a cross section of a human hair — it becomes invisible to the naked eye. At 10µm or smaller, the particulate is considered "respirable". These particulates have become highly regulated, having been linked to chronic

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lung diseases some workers experience later in life, which has drastically lowered the mortality rate.

The chute design can have a significant impact on the volume of particulate matter emitted during conveyor transfers. Chutes that are properly sealed and retrofitted with three curtain zones incrementally slow the airflow and allow dust to settle. Field tests show a drastic reduction in emissions of both nuisance and respirable dust. [Fig.3]

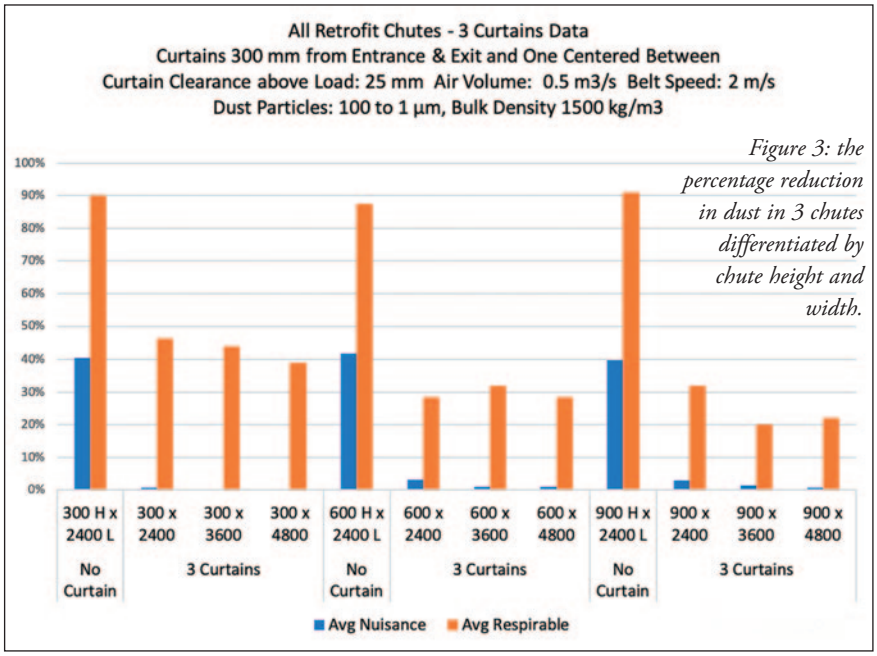

Figure 3: the percentage reduction in dust in 3 chutes differentiated by chute height and width.

Identifying the root causes of dust

Many operators have the misperception that, in the inherently dirty business of mining, processing, and handling bulk materials, dust control is a futile battle that can never be overcome. This is particularly true when experienced maintenance staff gaze baffled at a transfer point engulfed in dust that provides no clue as to the source of the emissions.

Air flow through the transfer point is achieved by adjusting the loading angle and the proper placement of dust curtains. With a centred and sloped or spoon-shaped loading configuration, the cargo is eased onto the belt with less impact (and associated belt damage), no splashing, reduced air turbulence, and less shifting leading to potential mistracking. Proper placement of curtains creates zones where air is slowed, allowing dust to settle back into the cargo stream or be sequestered into dust collection systems.[Fig. 4]

Material degradation increases small fines in two ways. As raw material is processed through crushers or mills, it is reduced in size and dust becomes more prevalent. Degradation can also be caused by the impact of material upon transfer resulting in it breaking apart.

Poor transfer point design for current production expectations is perhaps the largest cause of dust. Conveyor systems are generally built for the production demand at the time of construction and leave little room for change. Increases in production require either a greater volume of conveyed material or higher belt speeds. Often, they result in both. If the system is not graded for these expectations, dust becomes the bellwether for a host of other issues such as reduced workplace safety, increased spillage, more frequent equipment breakdowns and excessive downtime.

Best practices for belt conveyor dust control

- **Avoid belt sag:** support the belt the entire length of the chute wall (aka — the 'skirtboard') so it doesn't sag away from skirting. The pressure from air turbulence is enough to push dust and fines out of these gaps causing excessive dust and spillage.
- **Wearliners increase the conveyor system's life:** modern chute design raises the height of the chute, providing more room for dust settling in the stilling zone and also room to place the external wearliner. Without it, the rubber skirting takes the force of abrasive bulk material which lowers the equipment's life and requires premature replacement.
- **Install belt skirting to seal the environment:** single skirting should be cut to the belt's trough angle for a tighter seal and mounted externally for easy and safe adjustment. Self-adjusting skirting has spring-driven latches that offer slight downward pressure for reduced maintenance. Dual skirting offers a single skirt with a rubber flap that provides a second layer of sealing and protection from spillage and emissions.
- **Seal before adding dust collection devices:** 'passive dust control' uses engineered design solutions such as controlled loading, wearliners, skirting, curtains, and modular enclosures first. When there are length restrictions for chutes to allow an extended stilling/settling zones, dust bags and mechanical air cleaners are highly effective. They use the airflow to direct dust toward the mechanism and once the conveyor system stops, that collected dust is deposited back onto the belt. However, they can require more maintenance and monitoring, so

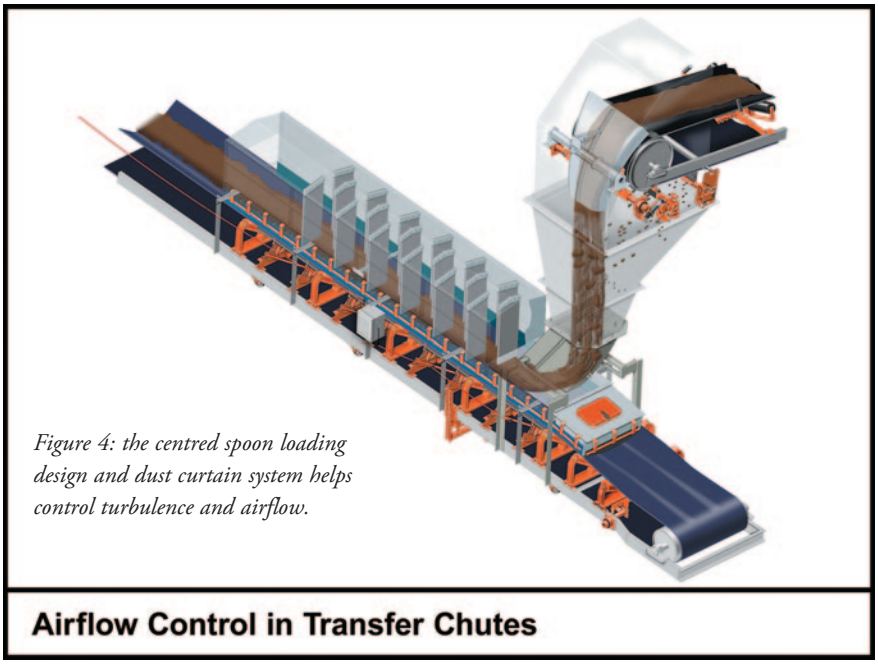

Figure 4: the centred spoon loading design and dust curtain system helps control turbulence and airflow.

Airflow Control in Transfer Chutes

sealing first will better control the cost of operation.[Fig.5]

- **Slow the exiting air velocity:** a flow of air is still going to be prevalent exiting the system, but the key is slowing it to under 200fpm (1m/s), slowing it enough to reduce emissions. Adding a tail panel and curtains is essential to this, however, just adding them at the ends does not accomplish the proper stilling environment required. Strategic placement is the key to slowing exiting air velocity.

Figure 5: mechanical air cleaners are low-maintenance and improve the air quality around the system.

Case study — coal mine in Jining City, Shandong Province, China

A coal mine in east China with production of approximately one million tonnes per year was experiencing dust and spillage from one of its main conveyors. Excessive fugitive dust lowered the air quality, clogged equipment and had the potential to affect workers' health. Belt misalignment caused by frozen idlers resulted in piles of spillage that required clean up, increased labor costs and reduced system efficiency. Operators attempted to build a settling zone in-house, but it was found to be ineffective and dangerous to maintain. [Fig.6]

The Martin Engineering team created a transfer point system that effectively settles the load and centres it on the belt in a sealed environment. Martin Engineering technicians installed a Martin® Impact Cradle, Martin® Slider Cradle and Martin® GravitySeal™ Self-Adjusting Skirting, as well as a Martin® Tracker™ to maintain proper belt alignment. Designed for heavy, high-impact loads, the transfer point features low-friction polyurethane bars and rubber skirts that retain a tight seal on the belt, reducing spillage and dust emissions.[Fig.7]

The customer reports a drastic reduction in fugitive dust and spillage,

resulting in fewer equipment breakdowns, better air quality and increased production, with less product loss. Operators say that they are "very satisfied" with the products and service Martin provided and will continue a positive working relationship.

Conclusion

Improving workplace air quality seems like a daunting task but eliminating it increases compliance and raises staff morale and safety. Of course, conveyor transfer points are not the only source of dust. However, as one of the most prevalent generators of particulate emissions in any bulk handling operation, it is an excellent place to start. By following best practices using modern and well-designed retrofitted components, operators can tackle dust by a process of elimination.

Once large emission sources are addressed, it is easier to identify dust from other parts of the operation with the ultimate goal of a clean and efficient operation with high worker morale and an exemplary record of safety.

About the author

Jerad Heitzler, Training Manager / Martin Engineering is programme manager and lead instructor for Martin Engineering's FOUNDATIONS™ Training Workshops. He is a leader in helping the industry learn how to make the handling of bulk materials cleaner, safer, and more productive. He started with Martin Engineering as a Customer Development Representative in 2006. He soon realized his love for presentations and for teaching about conveyor systems, and so in 2010 took over management and development of the company's FOUNDATIONS™ Workshop programme. Under his leadership the programme has expanded to offer several levels of conveyor improvement workshops around the world.

Figure 6: coal dust clung to every surface of the operation, seizing rolling components and machine parts.

About Martin Engineering

Martin Engineering is a global expert in bulk materials handling solutions. For over 80 years, Martin has designed, manufactured and installed innovative products that make the world's foundation industries cleaner, safer, and more productive. Based in the USA, the privately owned company has drawn on its unrivalled experience and expertise to help operations improve safety, enhance material flow, reduce spillage and dust, and minimize downtime. With factory-owned facilities in 20 countries, on-the-ground presence in another 40, and a worldwide service partner network, Martin has built an enviable reputation for high performance products delivered with exceptional technical service and support. The company's comprehensive *Foundations*™ textbooks, learning resources, and training programs are the global standard for the efficient and effective design, operation, and maintenance of bulk materials handling equipment.

Figure 7: a cradle and idler system ensures a smooth and sealed belt path through the length of the chute.

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Negrini company, established in 1967, specializes in engineering and manufacturing a comprehensive range of grabs and buckets for rope machines and crawler mounted cranes; they are employed to do many jobs. Negrini buckets and grabs are very well-known for quality as well as for the very accurate and skilful engineering work; in fact Negrini supports their clients by analyzing the job to be done and, if needed, by adjusting the standard design of grabs and buckets to enhance their performance once in operation.

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Coal and lignite: Rulmeca keeps the coal industry moving

Resistant belt conveyor parts to handle minerals and combustible materials

Rulmeca has always been a prominent figure in the design and manufacturing of bulk material handling components. Its wide range of products includes rollers, transoms, pulleys, motorized pulleys, covers, cleaners and other accessories to set up belt conveyors. Thanks to its competence, the company provides reliable support and can recommend the product most suited to the specific application.

Among possible fields, Rulmeca bulk handling solutions are ideal to assemble mining conveyor systems. Rulmeca material handling components are used at every stage of this application: from the initial dig and transportation of any type of materials from the extraction point to the production of refined market-ready materials and all the intermediate steps required.

The most efficient solution in mining critical environments

While the design for each project is highly specific, material handling components are the elements that make a difference in mining conveyor belts. Strong, safe and reliable parts are required to support heavy loads and resist to wear, due to the various conditions of materials and environment. The quality and durability of the design and materials of Rulmeca products guarantee full efficiency and functionality in mining critical environments. They can be used for any conveyor belt that requires the transportation of heavy and abrasive materials (coal, lignite, gold, copper and so on) and in any range of temperatures, both for underground and open-air extraction.

Therefore, Rulmeca is now a reliable partner for the updating or modernizing of production lines as required in many industrial sectors. Indeed, the growing demand for raw materials combined with systems offering ever-higher levels of performance require increasingly flexible handling. To this end, the use of conveyor belts is undoubtedly the fastest, most practical and economic solution.

Customers in Thailand rely on proven products

The long-term relationships of RULMECA to the owner of the opencast mine as well as to the service provider for the overburden excavation and the associated very good experiences with RULMECA products made SAHAKOL easy to make the decision.

At the end of 2016, RULMECA Germany GmbH received an order for the delivery of rollers and garlands for the equipment of the new conveyor belt systems of the overburden project No. 8 in opencast mine MAE MOH in northern Thailand. Approximately 18km of belt system in the widths 2,600mm, 2,200mm and 1,800mm are equipped with RULMECA technology for the upper and lower belt as well as the transfer stations. SAHAKOL Equipment Public Company Ltd. is the contracting partner for the procurement of the rollers and garlands. SAHAKOL operates conveyor belt systems for the EGAT (Energy Generating Authority of Thailand). The long-term relationships of RULMECA to the owner of the opencast mine as well as to the service provider for the overburden excavation and the associated very good experiences with RULMECA products made SAHAKOL easy to make the decision. In the very well maintained belt systems, ten-year and longer service life is common.

In Thailand, too, the use of conveyor systems is increasingly seen from an ecological point of view. Low energy consumption and low noise emissions also belong to the requirements for bearing rollers, such as long life and associated material and cost savings. SAHAKOL has decided to use rollers with a diameter of 194mm. Compared to the diameter of 159mm used in older belt systems; there is a considerable advantage in terms of energy consumption due to the considerably smaller pushing rolling resistance. With a belt width of 2,000mm and a belt length of 1,887m, the reduction in the pushing rolling resistance of up to 300kW is achieved. Taking into account the fact that the energy is generated in a coal-fired power plant, this means a CO_2 saving of approximately 2,400t/year. These data have convinced the owner of open pit mining and the operator of the conveyor systems. In the peripheral equipment such as excavators, crushing plants or spreaders, RULMECA rollers of the same type are used on the operator's request, which significantly improves spare parts stock and availability.

Energy generation from coal is an important part of the energy mix for the emerging economies in Southeast Asia. With advanced technologies, such as those from RULMECA, this can help to limit the emission of climate-damaging CO_2. Until renewable energies have increased their share so that CO_2 emissions can be reduced, the focus lies with the Thai energy supplier EGAT on the efficiency improvement of existing plants.

Also in other industries and regions of the world, the energy-saving and noise-reduced roles of RULMECA find their field of application. Whether in bulk port installations, iron ore or copper mining, building material production or the transport of other bulk materials RULMECA rolls are enjoying a strongly growing demand. The roller types developed in the RULMECA laboratory can be largely adapted to the customers' requirements and thus provide maximum efficiency for the operator. The modern and powerful RULMECA test bench is specially designed for tests and developments in order to adapt the products to the ever-increasing market requirements.

The seven-layer dip of dust sampling with WeatherSolve Structures

Using comparative data to prove wind fence effectiveness in coal handling

Who doesn't like a good seven-layer dip!? Every bite of this Tex-Mex party favourite contains a layer of goodness. Be warned though, if you miss a layer, you compromise the entire flavour: much like dust sampling in coal operations that lacks a layer of consistency in data collection or analysis.

Coal handling is notorious for dust emissions. It's simply par for the course. Those in the industry are familiar with strategies used for dust mitigation such as wind fences. The question is, do you know how effective your wind fence actually is?

Welcome to the seven-layer dip of dust sampling to determine wind fence effectiveness in coal handling. Each layer is essential to the final result, and at WeatherSolve Structures, the company has come up with a recipe option to provide customers with measurable values for wind fence effectiveness and dust control without the huge price tag seen with some other modalities. It should be noted that dust sampling is also useful for quantifying the effectiveness of other dust control systems or system combinations.

Layer 1: the refried beans base — site topography & wind patterns

Dust fate on coal handling sites is impacted by a long list of variables. Among these variables, one of the most prominent is wind. Since many coal handling operations are located near ports, wind is typically constant and unforgiving leading to material loss, regulatory non-compliance, and pollution.

The base layer of any good seven-layer dip is a foundation to hold the entire dip together. WeatherSolve Structures' base layer in dust sampling is made up of a topography and wind patterns.

On-site airflow behaviour depends on the unique layout and topography of the individual site in relation to wind speeds and direction. For instance, hills, trees, buildings, and stockpile dimensions all play a role in how the wind will behave and transport dust — the 'aerodynamics' of the site if you will.

This first layer of WeatherSolve's dip provides insight for dust sampler positioning to allow for the capture of the most relevant and applicable data. If this layer isn't done well, our entire dip will just fall apart.

Layer 2: the guacamole — installing the dust sampler

You can't measure the effectiveness of a wind fence using dust sampling if you don't have data on what the dust levels were before it was installed. The second layer involves installing WeatherSolve dust samplers at the strategic locations we identified in Layer 1.

Layer 3: the sour cream — dust collection

There has been a substantial amount of research conducted on dust sampling and many recommendations with regard to set up. Keeping things simple is often the best strategy, especially in this type of application.

Here is how it works:

- 1. Samplers are affixed to a supporting pole at varying pre-established distances from the ground. Think of a sampler as a fish trap — there is a constant size opening for the 'fish' (dust) to get in and then a mechanism to keep the 'fish' (dust) from escaping.
- 2. The samplers are designed to freely rotate around the supporting pole. This means that they are always positioned parallel to the wind regardless of which direction the wind is blowing.
- 3. The supporting pole is placed into the ground at the established collection areas.
- 4. The wind carries dust and dust gathers within the sampling containers.

This allows for the collection of the raw data on the amount of dust at the

collection point under normal pre-wind fence conditions.

Layer 4: The salsa - setting up for success

The salsa of any seven-layer dip is what gives the entire dish a 'kick' of flavour. I'd argue it's the best part.

The same goes for this layer of dust sampling. This step is the cornerstone for successful data collection and what ensures accurate results. Setting up for measurements involves consistency and reproducibility of results. This means following the recipe for:

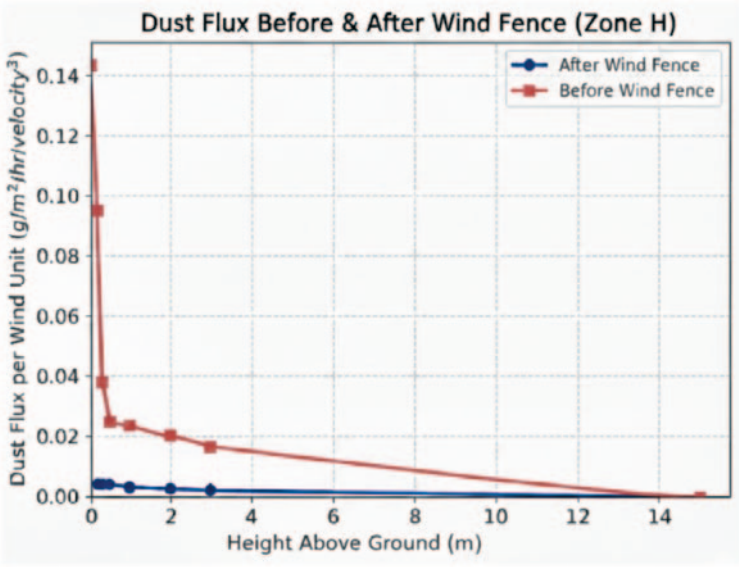
- 1. Exact location and positioning of samplers.
- 2. Frequency of measurement intervals.
- 3. Pre-determined heights for sampling containers (typically from a few millimeters above the ground to up to three metres above the ground will give an excellent profile of dust leaving the site so that losses can be calculated).
- 4. Pre-determined distance from the ground to the first sampling container.
- 5. Same temporal conditions for measurements (season, time, etc…).
- 6. Choosing time intervals (eg. a week) where pile dimensions, moisture content, reclaiming activities etc… are similar.

Being meticulous in documenting and executing this layer means that the before and after results are actually showing the decrease in dust levels post wind fence installation rather than a change in the recipe.

Layer 5: The shredded cheese — dust measurement

You may be thinking that fancy sensors or other high-tech devices are used to measure dust at the collection points. They certainly could be, but for our application we generally only need an close approximation of wind fence effectiveness. Unless, conducting precise research using ASTM D1739 standardized methods, weighing the dust collected in the samplers will suit just fine.

Dust is gathered at predetermined intervals and weighed. This pre-wind fence installation dust collection establishes our baseline. Note that the interval and collection time will vary from site-to-site dependent on dust volume. The key is to establish a collection frequency so that the dust doesn't fill the samplers rendering the data collected completely useless. A good rule of thumb is to establish a frequency where the samplers are around 25–50% full by the time of collection. It is important to note that when the samplers nearer to the ground are 25–50% full, the upper samplers will still have very little dust in them.



Graph showing dust flux before and after wind fence installation

Layer 6: The diced tomatoes — measuring results post wind fence install

This is the garnish layer. This is where we measure the 'meat' of the matter — the results. Once the wind fence is installed, the samplers are once again instated.

The key to this layer is consistency. For accurate results the sampler position, location, collection frequency, and seasonality must all be same. In other words, the methodology and set up pre-installation dust collection must equal the methodology and set up post-installation.

Layer 7: The olives — data analysis

The final layer of the dip is analysing the data collected both pre and post wind fence installation and comparing the results. This is where the percentage of reduction in dust is determined to prove the effectiveness of the wind fence. From a capital investment perspective, think justifying your CAPEX.

By comparing the weight of the coal dust from the baseline data that was gathered in Layer 5 with the weight of the dust gathered in Layer 6, it is possible to arrive at a clear comparative value of wind fence effectiveness. This isn't as simple as just comparing pre and post weights. What is actually being measured is dust flux. Simply put, dust flux is just 'dust in motion' adjusted for the wind. It is the total amount of dust moving through the air over a set period of time, adjusted for wind speed and direction.

These dust flux calculations will give a general idea of what is happening with the dust, but to really get a thorough understanding, WeatherSolve recommends taking the results of these flux calculations and tying that into what is already known about the site wind velocity and relationship between dust transport and wind speed. This gives an extra 'layer' of information that can be incorporated with known wind rose data to extrapolate the results to reliably predict dust transport over longer durations of time.

Pre-installation dust sampling can also be useful to identify the source of dust when planning a wind fence. Looking at the individual dust particle types from sampling can lend some very useful information in this regard.

The full bite of 7-layer dip

Just as you wouldn't serve a seven-layer dip with missing layers, you shouldn't conduct dust sampling with missing data or a poorly thought-out dust sampling strategy. Dust sampling pre and post wind fence installation isn't just about gathering the numbers to show how effective the wind fence is, it's a tool for:

- Supporting regulatory compliance.
- Verifying your wind fence return on investment.
- Showing your commitment to air quality.

This sampling approach supports WeatherSolve's work in coal handling environments, where wind fences are designed and installed based on a site-specific aerodynamic concept to reduce material loss, enhance operational efficiency, and improve air quality.

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\ Passion for Performance.

Coal: why through-ship efficiency matters now more than ever

Despite long-term decarbonization goals, coal remains deeply embedded in global energy and industrial supply chains. Long-term forecasts indicate that demand will gradually plateau and begin to decline towards 2030, but it looks to be a protracted goodbye, with fluctuating climates, fuel prices and policy decisions all influencing worldwide demand.

Southeast Asia represents the fastest-growing coal market globally; India continues to expand coal capacity to meet its growing electricity needs; while China consumes more coal than the rest of the world combined, notes the International Energy Agency (IEA).

Through-ship efficiency: the real KPI

When energy markets tighten and vessels queue at the berth, what matters most is how quickly a ship can be emptied and underway, safely, cleanly and consistently. This is where through-ship efficiency becomes the defining metric and key performance indicator (KPI).

Traditional grab cranes look productive initially, but their performance drops as unloading progresses. As cargo levels fall, cycle times increase, fill factors decline and efficiency steadily erodes. Spillage and dust only add to the problem.

Siwertell screw-type ship-unloaders work differently. Their continuous unloading principle delivers a steady discharge rate from the first tonne to the final clean-up. Cargo level in the hold does not dictate through-ship performance, and neither does cargo type.

In real-world operations, this translates into average through-ship efficiencies of 70% or more, compared with around 50–60% for grabs. For example, a performance test was carried out with two Siwertell unloaders, each with a rated capacity of 2,200tph (tonnes per hour), discharging an 80,000 wt vessel fully loaded with coal. The unloaders delivered an average capacity above 77%.

Faster unloading means shorter berth stays, lower demurrage costs, more predictable operations, and higher jetty utilization rates and terminal productivity.

Experience benefits new installations

Decades of coal handling experience with continuous Siwertell screw-type ship-unloaders are proving critical to making new and existing coal handling operations as sustainable as possible.

For example, two large-scale Siwertell ST 790-D-type ship-unloaders now serve a newly developed ultra-supercritical power station in southern China, ensuring clean and efficient coal handling for their new owners.

In addition to their low weight, which minimized the load on the jetty, delivering significant cost savings in jetty construction, the Siwertell ship-unloaders, deliver market-leading through-ship capacities. These new units are rail-mounted and offer a continuous rated coal handling capacity of 1,800tph, with a peak capacity of 2,000tph, discharging vessels of up to 100,000dwt.

Environmental pressure accelerating the shift

Coal handling has come under intense environmental scrutiny, and rightly so. Dust emissions, spillage and noise pollution are no longer tolerated at many ports, especially those close to population centres.

Siwertell ship-unloaders are totally enclosed from the moment material enters the inlet feeder below the cargo surface until it reaches the jetty conveyor. There is no spillage and virtually no fugitive dust. They are also quiet neighbours for urban centres. This environmental performance is no longer a 'nice to have', for many terminals, it is what will make future operations possible at all.

Transition-ready: coal today, biomass tomorrow

More port terminals are being asked to ready for potential change: handle coal today, but maybe biomass tomorrow, often using the same port terminal technology. This shift is changing how operators think about the long-term flexibility and efficiency of their ship-unloading equipment.

Siwertell technology's capability to switch between fuels has been proven at facilities such as Drax Power Station in the UK, which has transitioned from coal to become the country's largest renewable electricity generator. Siwertell ST 790-D unloaders at Immingham and Liverpool were originally installed for coal and now discharge millions of tonnes of biomass annually. Similar success stories can be found in Denmark, Singapore and across Asia, where coal and biomass are handled seamlessly within the same infrastructure.

While co-firing coal with biomass, or converting plants entirely to biomass, has become a practical and widely adopted pathway for reducing carbon intensity without abandoning existing infrastructure, it creates a unique challenge.

Port terminals are required to have unloading systems that are robust enough to handle abrasive, sticky and high moisture content coals, but also switch to sensitive cargoes like biomass pellets, which are fragile, dusty and prone to self-ignition. Furthermore, biomass has roughly half the density of coal and around two-thirds of its calorific value, requiring significantly higher volumes to achieve the same energy output.

Unique design capabilities

Siwertell ship-unloaders offer several advantages. If a terminal is currently feeding coal to boilers, a Siwertell ship-unloader can handle it. If the power generator wants to co-fire, the unloader can handle both coal and biomass, and when ready, the ship-unloader can very efficiently discharge pure biomass, in several forms, from palm kernels and wood chips to dense, wood pellets.

Siwertell ship-unloaders mitigate the self-ignition risk that accompanies all biomass with a unique, integrated safety system, which incorporates detection measures including thermal cameras, temperature and pressure sensors and spark detectors. In the event of an explosion, fast-acting valve technology prevents it propagating downstream, while emergency discharge, directly to trucks, stops damaged cargo being transported any further. Globally, Siwertell ship-unloaders have clocked up around 100,000 operational hours of discharging biomass.

Preparing for what comes next

The energy transition is not linear. Coal demand may decline in some regions while increasing in others. Biomass may grow, diversify, or be complemented by other alternative fuels. What remains constant is the need for reliable, environmentally sensitive, high-performance ship-unloading technology.

Siwertell ship-unloaders are unique on the market, offering safe, high-capacity, continuous, totally enclosed biomass handling. They are designed not just for today's coal operations, but for the realities of tomorrow's energy landscape.

Tecpro Australia: supporting safe and efficient coal handling through engineered water-based solutions

Coal remains one of the most significant dry bulk commodities globally, presenting ongoing challenges in material handling, dust control, safety, and environmental compliance. Across Australia's mines, ports, and bulk handling facilities, effective management of coal dust and residues is critical to protecting workers, equipment, and surrounding environments. Tecpro Australia has established itself as a specialist provider of engineered water-based solutions designed to address these challenges across the coal supply chain.

Founded in Australia and operating nationwide, Tecpro Australia supplies equipment and systems for dust suppression, spray control, and industrial cleaning across mining, ports, and heavy industry. With extensive experience in coal handling applications, the company supports operators at every stage of material movement — from extraction and stockpiling to transfer, transport, and export.

Coal handling environments are inherently dusty, abrasive, and demanding, with conditions that place heavy strain on both equipment and personnel. Tecpro Australia's solutions are commonly deployed across coal stockpiles, conveyor systems, transfer points, shiploaders, reclaimers, and associated infrastructure.

Dust suppression is a core focus, particularly at high-risk points such as conveyor transfers, crushers, and loading zones. Tecpro supplies targeted spray systems that minimize airborne dust while optimizing water use — a critical consideration in both inland mining operations and coastal terminals. By applying controlled droplet sizing and strategic nozzle placement, these systems help maintain visibility, reduce health risks, and improve overall site safety without excessive water consumption.

In addition to dust suppression, industrial cleaning plays a vital role in coal operations. Coal build-up on machinery, chutes, hoppers, and structural components can lead to blockages,

Sprinkler from Tecpro Australia.

increased wear, and unplanned downtime. Tecpro provides high-performance water cannons and cleaning solutions used for wash-down, maintenance support, and removal of stubborn coal residues in heavy-duty environments.

Tecpro Australia supplies a broad range of equipment suited to coal handling, including spray nozzles, dust suppression systems, and industrial water cannons. Solutions may be provided as individual components or as fully engineered systems, depending on site requirements.

Tecpro works closely with clients to assess operating conditions such as material properties, throughput, wind exposure, and environmental constraints. This allows the company to deliver customized solutions rather than generic, off-the-shelf products. Systems are designed to be robust, reliable, and capable of withstanding the abrasive nature of coal and the harsh conditions typical of mining and port environments.

Tecpro's offering also extends to the design and supply of high-capacity water cannons used for equipment cleaning and heavy material removal. These units are increasingly utilised to improve maintenance efficiency, reduce manual cleaning tasks, and enhance safety by limiting personnel exposure to hazardous areas.

Evaporation.

Not all dust control systems are created equal.

Remaining competitive in the coal handling sector requires continual adaptation to evolving operational and regulatory demands. Tecpro Australia places strong emphasis on engineering-led innovation, with a focus on improving water efficiency, system longevity, and operational reliability.

Water management is a growing priority across the industry, and Tecpro works to balance effective dust control with responsible water use. Advances in spray technology and system design enable precise application, reducing waste while maintaining performance. This approach supports compliance with environmental standards and helps operators meet sustainability objectives without compromising safety or productivity.

Another key differentiator is Tecpro's local expertise and support. As an Australian-based company, Tecpro provides responsive service, technical support, and practical insight into the specific challenges faced by local coal operations. This proximity allows for faster problem-solving, tailored system optimization, and long-term partnerships with clients.

Tecpro Australia supports a wide range of clients across the coal sector, including mining operations, bulk material handlers, and export terminals. The company has delivered solutions for both new installations and upgrades to existing facilities, helping operators improve dust control, safety, and maintenance efficiency.

While many projects involve confidential client relationships, Tecpro's equipment is widely deployed across Australian coal facilities, where reliability and performance in demanding conditions are paramount. Experience across diverse sites allows the company to transfer learnings and best practices between projects, continuously refining its approach.

As coal handling operations continue to face increased scrutiny around safety, environmental impact, and operational efficiency, the role of effective dust suppression and cleaning solutions will remain critical. Tecpro Australia continues to invest in product development and system design to support safer, cleaner, and more efficient bulk handling environments.

By combining practical engineering expertise with a strong understanding of coal handling challenges, Tecpro Australia aims to remain a trusted partner to operators seeking dependable solutions in one of the industry's most demanding sectors.

Coal mine hose reel.

Global energy minerals solutions users can rely on

For more than 40 years, SGS has designed, constructed, installed, and commissioned client-dedicated, site-specific Mechanical Sampling Systems (MSS) that support critical commercial and operational decisions throughout the energy minerals value chain. SGS's experience in MSS spans more than 25 countries, including Australia, Indonesia, China, South Africa, India, Spain and Italy and beyond, reinforcing its reputation for integrity, impartiality, and accuracy worldwide.

Trusted sampling and assurance across the value chain

Understanding bulk material quality is fundamental to fair trade, quality control, and accurate mineral balances. When sampling systems are poorly designed or operated, the consequences can be significant: cargoes may be over- or under-valued;, penalties incurred; and commercial decisions compromised.

To mitigate these risks, SGS designs MSS that integrate seamlessly into material handling facilities and processes, combining a full range of equipment with turnkey construction capability. Whether aligned to established international standards or tailored to unique operational requirements, these systems are engineered to eliminate bias and deliver confidence from laboratory analysis through to port operations.

SGS designs MSS for a wide range of bulk materials, starting from the energy minerals products but also including alumina, bauxite, woodchips, ore concentrates, fertilizers, limestone, and more. This breadth of experience is underpinned by a deep understanding of material behaviour and handling characteristics, ensuring systems are fit for purposes and perform reliably over the long term. Sampling and analysis provide estimates of key quality parameters, but every estimate carries uncertainty. As an industry expert in bulk material sampling theory, SGS applies sampling statistics to quantify uncertainty and evaluate risk, enabling informed, defensible decision-making based on transparent data.

An effectively designed, constructed, and monitored MSS minimizes the risks associated with inaccurate results. Ongoing quality assurance, including monitoring of sampling ratios, periodic bias checks, and precision testing, ensures systems continue to perform as intended, and that uncertainty around results is clearly understood and controlled. For new installations, SGS begins with a detailed understanding of the sampling location and material properties, supported by site visits to confirm compliance with applicable standards and operational realities.

For existing systems, services include inspection, bias and precision testing, sample collection and analysis, validation and calibration, system upgrades, turnkey construction and commissioning, as well as ongoing operational and maintenance support.

Confidence, sustainability, and extended assurance services

Well-designed MSS delivers tangible safety, operational, and commercial benefits. By eliminating manual sampling on conveyor belts and enabling remote operation, risks to personnel are significantly reduced. Consistency recognized by international standards lowers human error, while measurable bias and precision provide confidence in material quality data. These advantages translate into reduced penalty risk, improved process optimization, and lower manpower and time requirements for sampling and preparation.

In addition to MSS, SGS also provides additional independent services that further reduce trade risk at critical transfer points. For example, during draft surveys, accuracy is essential, as draught reading directly determines the calculated weight of cargo carried by a vessel. Traditional

draught reading methods can be subjective and unreliable, particularly in challenging environmental conditions. To address this, SGS uses its patented and exclusively used Draft Survey Tool (DST), which enables its inspectors to obtain safer and more accurate draught readings, even in swell and wind conditions where conventional methods become unpredictable. The DST is the only tool on the market proven to support the determination of a vessel's cargo weight with a high degree of accuracy, significantly reducing uncertainty and dispute risk.

Furthermore, SGS also supports clients with independent stockpile inventory measurement, delivering reliable data for operational control, regulatory compliance, and financial reporting. As the first TIC company to develop the use of Laser Scanner technology in volumetric assessment, SGS accurately measures mineral stockpiles where the full surface area is visible by further implementation of drones and lidar tech. These services are delivered at ports, refineries, manufacturing facilities, and mine sites, providing precise volume and weight calculations. The resulting data enables more effective inventory management, supports excise and loan reporting, and informs purchasing and stock administration through rapid, repeatable calculations.

Commitment to excellence across the mining lifecycle

Across the energy and minerals lifecycle, the value of independent, technically rigorous assurance has never been greater. As supply chains become more global, materials more complex, and regulatory expectations more demanding, confidence in data is essential to maintaining trust between buyers, sellers, and operators. SGS meets this need by combining engineering expertise, scientific rigour, and a global network of specialists who understand both local conditions and international requirements.

This integrated approach supports consistent decision-making across borders, reduces commercial and operational risk, and enhances long-term asset performance.

Furthermore, SGS solutions are designed to minimize environmental impact, support regulatory compliance, and enable responsible operations, including technical insight to support effective water management and discharge strategies aligned with evolving sustainability expectations.

As global markets evolve, SGS additionally helps customers navigate new regulatory requirements, including the EU CBAM, while ensuring transparency and traceability across the supply chain.

"Clients today require global technical leadership and industrial expertise at every step of the value chain. Our state-of-the-art laboratories provide independent, third-party commercial analytical services at all critical supervision and transfer points.

Rapid turnaround times enable clients to assess their commodities efficiently and ensure contractual compliance," says Buddy Hancock, a 50-year industry veteran and Senior Director, Eastern Operations for SGS North America, Natural Resources.

Together, these capabilities reflect SGS's enduring role as a trusted partner, helping the global energy and minerals industry manage risk, ensure integrity, and move forward with confidence in an increasingly complex operating environment.

Compact and efficient components for better performance

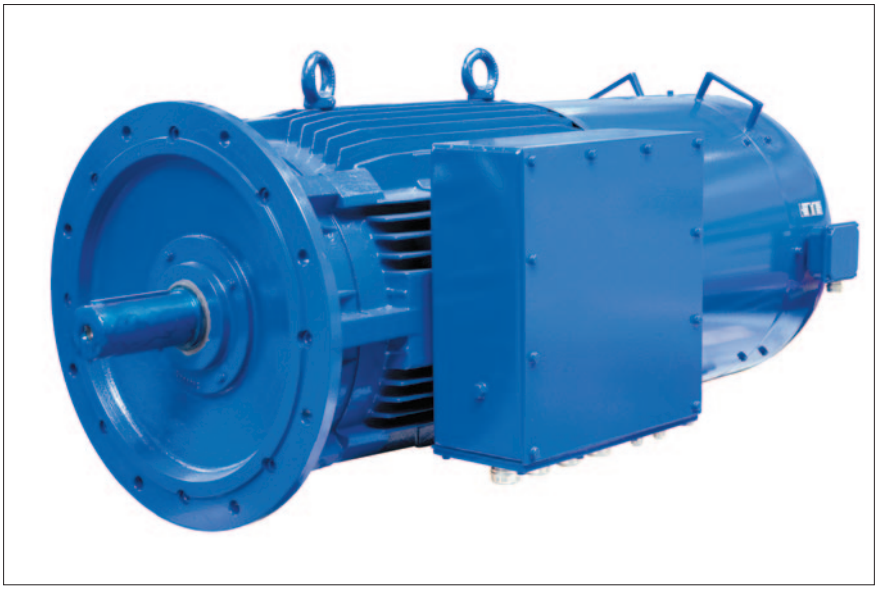
Efficient electric motors for use in dry bulk equipment

Electrical motors for use in equipment that handles dry bulk commodities — including coal — need to be powerful and offer high efficiency; they also need to reduce energy consumption at the same time.

Germany's WiCHMANN E GmbH designs and produces special inverter-driven low-voltage-squirrel cage-motors for cargo equipment like conveyors and cranes, which fulfil both of the above requirements. A special rotor-geometry leads to a higher pull-out torque of the motor. A WiCHMANN E GmbH motor has a pull-out torque of up to 400%, compared with approximately 250% of other motors. In this way, the motors can handle higher overload requirements, and the motor can provide high torque, also at high speeds. With this torque, the motor can also be controlled easily, even if it is operated at speeds of 1,600 or 1,800rpm. WiCHMANN E GmbH's goal is not only to optimize the efficiency of the motor itself, but to minimize energy consumption and maximize the power of the whole piece of equipment with the special motors.

The special rotor-design is also effective at a lower inertia. Based on this, the total inertia of the powertrain is reduced. This lower total inertia leads to lower energy consumption. On the other hand, it is possible to accelerate the speed of the powertrain, with the same energy level as another motor.

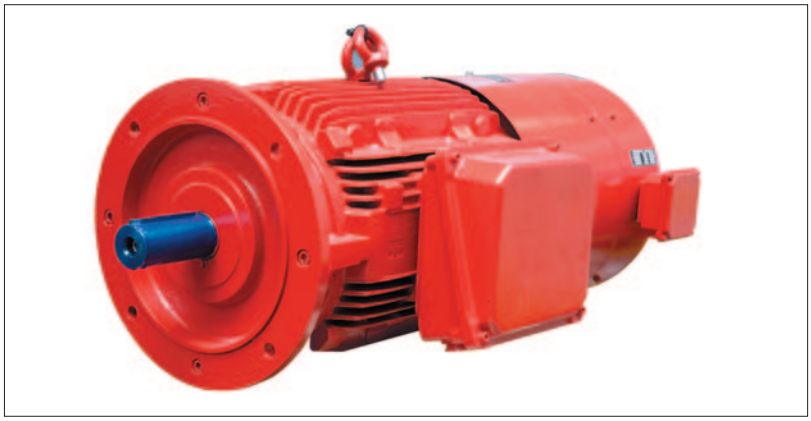
Based on the faster acceleration and deceleration process, a higher number of goods can be handled. Therefore, the user can increase turnover by handling a higher volume of material, or reduce energy cost, thereby protecting the environment. Lower inertia leads to further advantages, e. g. other components can be downsized. Depending on the design of the equipment, smaller gearboxes, brakes, inverters or cable diameters can be used. As a result, the weight of the application is lower, and investment costs are also lower.

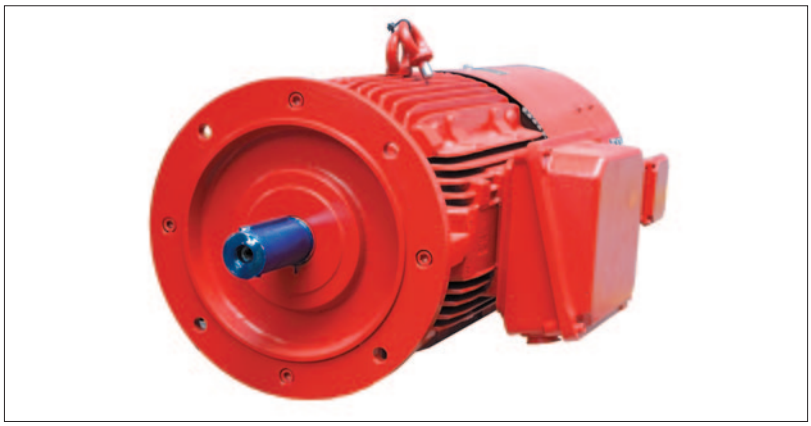


Finally, not only does the motor operate at a high level of efficiency the efficiency of the whole system is also increased by WiCHMANN E GmbH motors. Beside these technical characteristics, the reliability of a motor is a critical factor. In motors which are driven by frequency inverters, the windings need to resist partial discharges — so called voltage peaks. By using material which is designed for inverter operation and handmade windings, WiCHMANN E GmbH achieves a very long lifetime of the windings. Also, AC motors reduce the amount of maintenance required when compared with DC. While DC motors need periodic inspections and

reconditioning, especially for brushes, AC motors get by with inspection of motor connections and lubrication. The AC motors run very smoothly, so that significant reductions in mechanical wear and mechanical repairs e. g. in cranes have been noticed. The higher reliability of the electric motors results in fewer outages due to motor failure.

WiCHMANN E GmbH motors are built for use in extreme demanding environments, like dust, heat or marine conditions. For over 80 years now, the company has been developing and manufacturing electric motors for use in hoisting equipment, in and on ships, as well as in general mechanical engineering. WiCHMANN E GmbH provides steel-welded housings in addition to grey cast-iron-housing for surface-cooled motors; this, for example, makes it as easy and efficient as possible to make technological changes. Using the steel-welded design, WiCHMANN E GmbH provides 1:1 drop-in motor for retrofits. Normally the new AC motor can be offered in a smaller frame size compared to the existing DC motor. Therefore, the machinery house needs to be adjusted to the new dimensions. WiCHMANN E GmbH offers a new AC-motor with minimized inertia, but with the same mounting dimensions as the DC motor. So, the motor itself can be changed within one day, without modifying the basement of the machinery house and without shaft adjustments. This leads to a shorter downtime and lower costs. This steel welded housing design is available for surface-cooled applications like conveyor- and excavator-motors.





Optimizing investment in open-pit mines and large quarries

Open pit mining and quarrying operations represent a significant investment that needs to be managed over decades, *write Guido Hesse (FAM) and Ulf Gläsmann.* Optimizing performance and controlling operating costs are crucial, but any major change in use or increase to production capacity requires a further cash injection which can quickly escalate to millions. Reusing and upgrading existing equipment wherever possible, and only buying new where necessary, can significantly cut costs. It can also improve the bottom line by enhancing energy efficiency and sustainability efforts. So how do you find the financial sweet spot between purchasing new equipment and redeploying existing equipment?

Altering the operating parameters of an open-pit/open-cast mine or quarry is never an easy task, and it is certainly not cheap. Systems such as in- or off-pit crushing and conveying systems (IPCC) are complex, and materials may need to be transported over long distances and challenging terrain. Replacing old equipment with new — often in a different configuration — can be a logistical challenge. It takes time and effort to coordinate multiple different suppliers, oversee the installation of the right equipment in the right order, and ensure that the new systems are working correctly, both individually and collectively. Training staff to become proficient with the new set-up is also essential. It's unsurprising that mine and quarry operators and their financiers are showing unease about the scale of investment and the likely profitability.

Reducing capital costs

Increasing capacity, relocating spoil heaps, or reconfiguring a process does not necessarily entail replacing all the existing equipment with new models. A hybrid approach that reuses and repurposes existing components and equipment wherever possible can be a much more economical solution. For example, let's take a bucket wheel excavator with a 4,000 tonnes per hour capacity. A new replacement could cost around €30 million, depending on its features. However, upgrading or refurbishing costs significantly less and can extend the operational life of the existing excavator by 15 years or more, supporting sustainable mining practices.

Accurate investment calculations are essential in making a final decision but a hybrid solution that combines refurbished equipment with new equipment can yield savings of 50% or more compared to the 'all-new' equivalent.

The hybrid approach offers multiple opportunities for saving costs, including:

- Lower total investment requirement, which reduces interest on borrowing.
- Less need for complete overhauls and new purchases, which are more expensive and sometimes more complex.
- Shorter delivery timescales, as time-to-production for new equipment is longer.
- Reduced transport costs, as less new equipment needs to be shipped from the manufacturing locations to the final installation site.
- Lower depreciation, because the existing plant is being reused and upgraded where possible.
- Improved operating expenses (OPEX), due to the use of existing spare parts and enhancements in performance due to overhauling or upgrading current equipment.

It is important to note that, by law, any older equipment that is reused must comply with current regulations and standards, ensuring a hybrid design delivers comparable performance improvements to a new system.

Additional business advantages

Using a combination of old and new equipment in open-pit mines and quarries can undoubtedly deliver further business advantages.

Improved sustainability

This approach supports more sustainable operations by leveraging the usable life of existing machinery, thereby reducing waste and the need for new resources. Ensuring that all equipment, whether old or new, meets the latest standards and regulations supports compliance, minimizes environmental impacts and makes for a safer working environment.

Greater efficiency

Improved efficiency is another benefit. Combining old and new enables existing equipment to benefit from technological improvement while maintaining its proven functionality. One example is the integration of new sensors and controls on older equipment to enable a higher degree of digitalization. Retaining familiarity with existing systems minimizes the need for additional training and makes it easier to estimate operational costs. Combining equipment such as this can even lead to improvements in energy consumption, emissions and overall performance.

Operational flexibility

A hybrid approach also allows for customization and scalability, as machinery parts or whole system components can be replaced or upgraded as needed or even used in a different location within the mining plant, without incurring the cost of a full replacement. A hybrid solution contributes to a smaller environmental footprint, as well as reduced after sales service costs, increased safety, and operational simplification. In a flexible solution such as this, the addition of digital features including data collection and analysis create adaptation recommendations which are truly invaluable.

Achieving optimal value

The key to success and optimal cost savings and other benefits associated with a hybrid equipment approach is to work effectively with a highly qualified engineering partner who has many years of extensive practical

experience and technical expertise.

The customer-supplier relationship is pivotal for success. The scope of the project must be clearly defined, based on a detailed assessment of existing equipment and a clear understanding of operational needs and targets. Therefore, it is imperative to establish effective communication with your chosen engineering partner from the outset, to ensure that the project aligns with operational requirements and sustainability objectives.

In addition to identifying the equipment requirements, consideration should be given to the long-term support and maintenance management required to ensure that an operation derives ongoing value from the investment.

To optimize efficiency and sustainability of dismantling/assembly, it is essential to look for a partner who has an established local setup or can mobilize one to assist with any tasks at hand, mainly planning, execution and maintenance of the plant. The integration of manufacturing capabilities in the destination country can support the local regional economy and reduce the carbon footprint that would otherwise be characterized by transporting heavy machine parts over long distances.

It's incredibly important to check whether your engineering partner offers any form of guarantee or warranty for the upgraded components. For instance, if the new mining plant design needs to operate for 20 years, a warranty up to 24 months on refurbished or upgraded components could be reasonable.

Role of reverse engineering

Reverse engineering is critical in cases where no data about old parts or machines is available (for example, due to loss of records or machine obsolescence) and enables necessary drawings and other data to be created from detailed modelling of the existing components. It enables accurate identification of which older components can be integrated into the new system, reducing the need for entirely new equipment to deliver cost-savings and improved sustainability by reducing waste and promoting the circular economy. A chosen engineering partner should have excellent reverse engineering credentials, as carrying out this kind of optimization requires an experienced engineering company who is familiar with all relevant norms, regulations and technical backgrounds.

The engineering partner selected will be capable of inspecting each piece of machinery to initially ascertain the requisite intervention needed. Then, they will identify parts that are structurally relevant, and which are functionally necessary. This information is then applied when considering if a component can be reused or repurposed, whether it requires an upgrade or even if an entirely new part is required. This detailed survey should extend to any ancillary equipment such as drives, switches, control stations, hoists and so on.

The result will provide a detailed checklist that outlines the required intervention — and therefore the financial investment — required for every component to achieve the agreed-upon business goals. This checklist can then be used to clarify who is responsible for each action, so that labour and time inputs are optimized.

Conclusion

Many mining and quarrying operations delay capital investment decisions because they believe new equipment is simply unaffordable. However, working with a trusted engineering partner that understands mining and quarrying equipment and the commercial imperatives can enable a hybrid approach that reuses existing assets wherever possible to significantly reduce the investment requirement and deliver the project in less time. This not only improves the balance sheet but offers higher efficiency, extends equipment life, ensures compliance and competitiveness, and fosters more sustainable working practices. DCi

Under the lid

covered storage revealed

TAKRAF Circular Blending System designed as part of a stockyard package for a DRC

Jay Venter

Enclosed by design: High-capacity systems for complex bulk material

From extreme climates to difficult-to-handle materials, TAKRAF Group's equipment for enclosed storage and conveying is designed to deliver reliable, economical performance while maintaining a low environmental impact.

As environmental regulations tighten and operators seek greater control over material quality, enclosed storage and conveying systems are rapidly becoming a cornerstone of modern bulk material handling. Across industries ranging from mining and fertilizers to power generation and steelmaking, enclosed solutions are being adopted to minimize emissions, protect products from weather exposure and ensure consistent, reliable operation.

Against this backdrop, TAKRAF Group continues to see strong global demand for its enclosed storage and handling technologies, with operators looking to the Group to design robust, high-capacity systems capable of handling challenging bulk material, without compromising safety, efficiency or sustainability.

Continuing strong demand

TAKRAF Group's enclosed storage solutions are deployed worldwide, handling a wide range of commodities, often in some of the most demanding operating environments and complex applications.

At a major copper operation in the Democratic Republic of Congo (DRC), TAKRAF Group has recently completed the supply of an enclosed stockyard package, comprising a radial boom stacker, bridge scraper reclaimer, two portal scraper reclaimers and an overhead tripper conveyor. In North Africa, a recently awarded contract covers the engineering and supply of seven stockyard machines, including four stackers, two bucketwheel reclaimers and one portal reclaimer, for an important phosphate hub.

In another challenging application in Africa, the Group supplied a 400tph (tonnes per hour) portal scraper reclaimer for an enclosed urea storage facility at a mega fertilizer plant in Nigeria. Urea's hygroscopic nature required meticulous design measures to prevent moisture ingress and product degradation. Conveyor galleries and transfer towers were fully sealed, and the reclaimer was fitted with a de-lumper to break down material agglomerations formed during storage. Despite the complexity of the application and a tight project schedule, the system was delivered and commissioned successfully.

TAKRAF Group has seen similar success across Asia. In Japan, the Group supplied four large portal scraper reclaimers as part of a material feeding system for a multi-commodity power plant. The plant uses a combination of thermal coal and biomass.

The reclaimers, each rated at 1,100tph and capable of restoring and blending material, are located within the combination fuel warehouse, which is divided into two sites. Given the requirement for redundancy, in which two machines operate on the same rail within the same building, a dedicated safety and anti-collision system was incorporated. With an in-line double-boom arrangement, the reclaimers also feature a special, hydraulically movable link between the main and auxiliary boom to enable both improved scraping efficiency and the ability to reclaim material from the bottom of the stockpile. Such TAKRAF machines are state-of-the-art equipment and some of the largest built.

A further feature of each machine is a specifically designed platform to carry a small bulldozer, which can be dropped off at any point along the stockpile for cleaning purposes.

In China, TAKRAF Group supplied a major steel producer, over a five-year period, with eight 1,500tph semi-portal scraper reclaimers and one portal scraper reclaimer for covered raw material storage. The repeat awards highlighted the machines' consistent performance and long-term reliability.

In Bangladesh, TAKRAF Group delivered four full portal scraper reclaimers for an enclosed storage project linked to a major thermal power plant. Each twin-boom machine has a capacity of 1,250tph and a main boom length exceeding 37m. The project also included high-capacity rail-mounted grab ship-unloaders, illustrating TAKRAF Group's ability to integrate storage and material handling into a cohesive system.

Stockyard machines for enclosed applications

Handling bulk material within enclosed facilities presents a distinct set of technical

challenges. Moisture sensitivity, material stickiness, abrasion, lump formation and dust generation must all be addressed at the design stage. TAKRAF Group's experience in this area is illustrated by its leading portfolio of stockyard machines, including combined stacker-reclaimers, bucket-wheel reclaimers and scraper reclaimers, each suited to different operational requirements.

In particular, scraper reclaimers have become increasingly popular for fully automated enclosed storage facilities, with TAKRAF Group responsible for more than 400 installations worldwide, across a wide range of industries and material types. Their advantages include gentle material handling, reliable reclaiming of difficult materials and low operating costs, making them well suited to enclosed environments.

Enclosed conveying

Storage solutions are only part of the enclosed materials handling equation. Conveying systems must also protect both the material and the environment while ensuring stable, efficient transport. As a result, TAKRAF Group designs and supplies overland conveyors, in-plant conveyors and tube conveyors for enclosed applications.

Tube, or pipe, conveyors are, notably, gaining popularity due to their ability to follow flexible routes, reduce transfer points and prevent cross-contamination between material and surroundings. They are equipped with the patented TAKRAF Automatic Belt Training System (ABTS), which overcomes the operational challenges of belt twisting and overlap control at the discharge point. The system continuously measures and corrects belt position, ensuring the correct overlap at the discharge area and reducing the risk of instability during operation. The ABTS has been implemented on numerous installations worldwide.

For example, at a Bulgarian power plant, a 1,400tph tube conveyor transports residual materials (ash and gypsum) from the power plant to the disposal area, providing exceptionally environmentally friendly operation. At a length of 4,535m, the conveyor follows the natural terrain with tight horizontal and vertical curves, and utilizes the advanced belt training system for proper discharge positioning.

Engineering expertise and lifecycle support

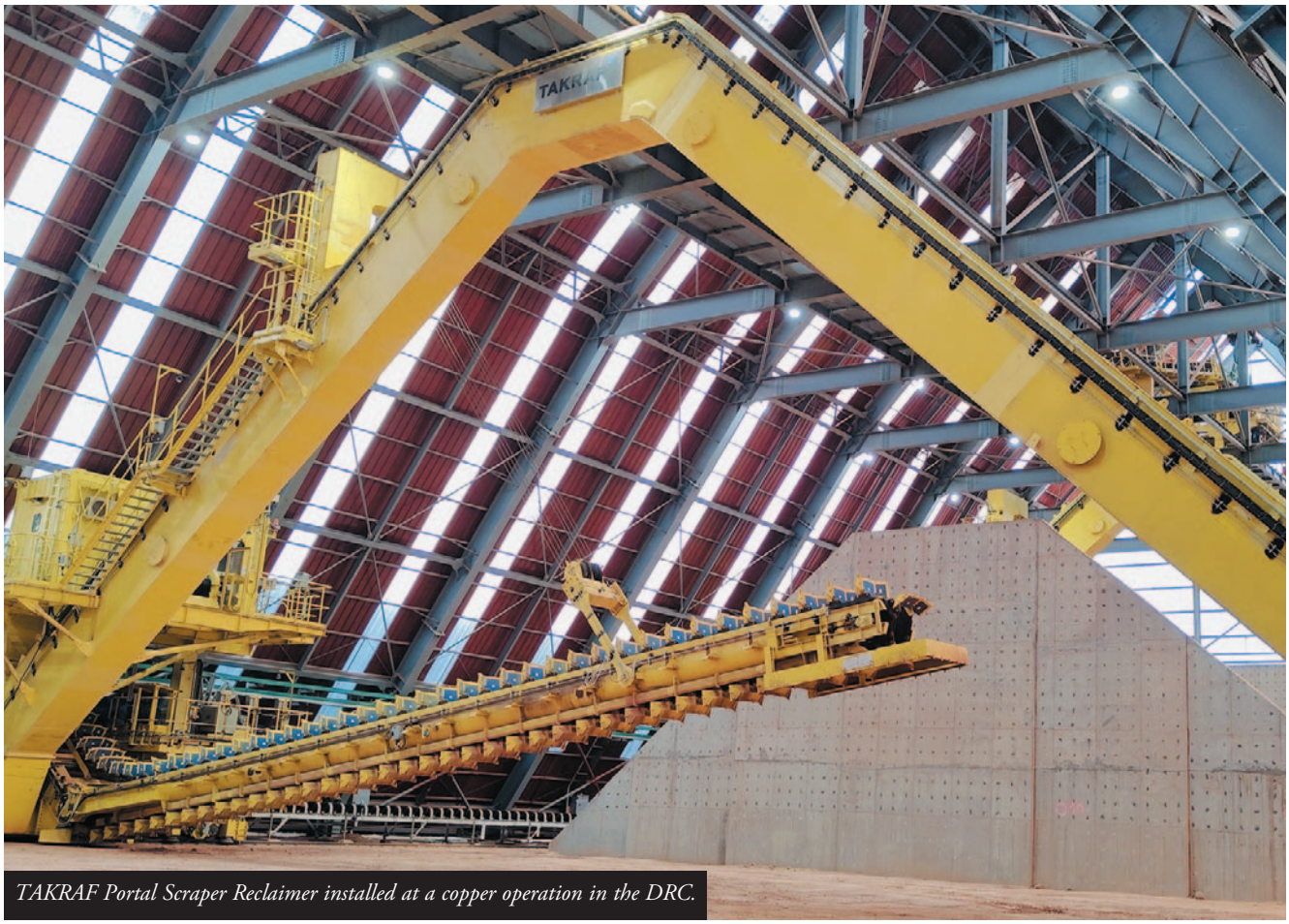
Since successful enclosed storage projects depend as much on planning and execution as on equipment selection, TAKRAF Group supports its clients with comprehensive engineering services, including feasibility studies, solution development, capacity expansion and refurbishment of existing facilities. Its scope spans the full project lifecycle, from supply and erection through commissioning, maintenance and modernization.

True to its guiding principle, **æFor Mining with Meaning'**, TAKRAF Group continues to integrate advanced engineering with proven technologies, helping operators worldwide transition to cleaner, safer and more efficient enclosed storage solutions.

About TAKRAF Group

TAKRAF Group, through its established and well-known brands, TAKRAF and DELKOR, provides innovative technological solutions to the mining and associated industries. With experience acquired over more than three centuries, the Group is well positioned to provide equipment, systems and services that best satisfy its clients' mining, comminution, material handling, liquid/solid separation and beneficiation requirements.

Servicing owners and operators around the world, TAKRAF Group's engineered solutions are customized to the unique project requirements and are aimed at lowering the total cost of ownership and reducing environmental impact by improving efficiency with safe and reliable equipment.



TAKRAF Portal Scraper Reclaimer installed at a copper operation in the DRC.

Port of Rotterdam Authority and VOTOB take new step in combating storage spoofing

At the World Port Center, a co-operation agreement was signed between the Port of Rotterdam Authority and VOTOB (Association of Dutch Tank Storage Companies) to continue and expand a task force aimed at combating the fraud scheme known as storage spoofing. With this step, both parties send a clear signal to international fraudsters who target the port of Rotterdam and other seaports with this persistent form of deception. TCT The Commodity Traders and the Police (Seaport Police District, including the Digital Expertise team) are also part of the task force.

From left to right: Marijn van Schoote (Director Ferm Seaports), Willem-Henk Streekstra (Director of VOTOB), Ronald Backers (Advisor Business Intelligence Port of Rotterdam Authority).

Storage spoofing

Storage spoofing, or tank storage spoofing, is the collective term coined in Rotterdam for all forms of selling non-existent storage capacity and inventories of raw materials and products at terminals, particularly in the port of Rotterdam area. In this form of internet fraud, criminals offer goods via fake websites that impersonate well-known tank storage companies. Victims include, on the one hand, international traders who are misled and lose substantial sums of money to non-existent deals, and on the other hand legitimate companies in the port area whose names and data are misused. In some cases, tank trucks even arrive at terminals to collect products that do not exist. The annual damage to traders is estimated at at least €10 million, as a lower bound based on insight into amounts actually paid (i.e. only the amounts that are known). In 2025, deals with a total offered value of €2.5 billion were reported to the task force. In addition, there is significant damage for companies whose names and data are misused, as well as reputational damage to the port(s) as a whole.

"Several of our members have been dealing with this for years," says Willem-Henk Streekstra, Director of VOTOB. "With this cooperation, we are providing professional support to reduce storage spoofing. It is good to address this issue so actively together with the Port Authority and other partners. Together we can do more than each of us individually. It remains extremely frustrating when your company name is misused and people lose large amounts of money."

History and task force

The first examples of this type of fraud date back some 15 years. About ten years ago, the number of incidents began to increase, leading to the establishment of a task force in 2017, at the time under the banner of Ferm Rotterdam (now Ferm Seaports).

Among other things, an awareness campaign was launched, laying the foundation for the current task force. Through interviews, background articles and tools on the website, a blacklist of unreliable websites and a whitelist of websites where entrepreneurs can safely do business, the fight against 'storage spoofers' was taken up. The blacklist of fraudulent websites now contains more than 1,250 domains and is continuously expanded.

The task force — consisting of Ferm, the Port of Rotterdam Authority, the Seaport Police and several VOTOB members — entered a co-operation with the Dutch Foundation for Internet Domain Registration (SIDN) in 2020 and with The Commodity Traders (TCT) in 2024. SIDN-supports the offline takedown of fraudulent websites with a .nl domain. TCT supports the task force with due diligence to assess the reliability of offered deals and documents and to determine which websites should be added to the blacklist. Fraud cases are prevented on a daily basis.

New co-operation

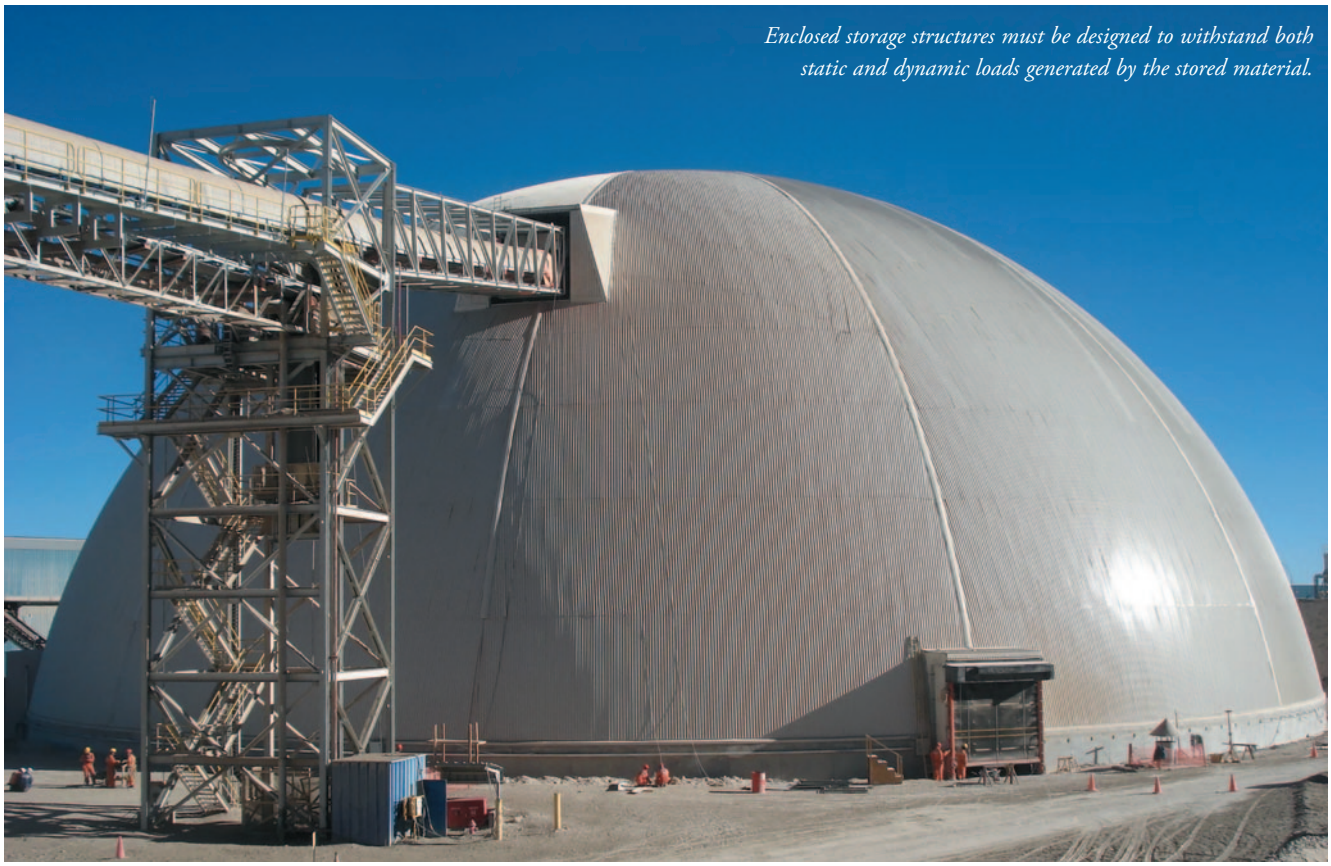
The task force previously operated via a domain managed by Ferm and the Port of Rotterdam, and has now moved to a new platform, managed by the Port of Rotterdam Authority, VOTOB, TCT and the Seaport Police. From VOTOB, several terminals in the port of Rotterdam also participate in the task force.

"Ferm Seaports is a national platform for the cyber resilience and robustness of seaports of national importance," says Marijn van Schoote, Director of Ferm Seaports. "Storage spoofing is a form of digitalized crime that affects the economy and the integrity of ports, as well as the people who work there. It is therefore positive that this new cooperation ensures continued attention to combating this type of fraud. We are very pleased that the Port of Rotterdam Authority and VOTOB recognize this urgency."

The primary tools used by fraudsters are fake websites, emails and other forms of digital contact based on trust and forged documents. Much information about (spoofed) companies is publicly available (via websites, chambers of commerce, Google Maps, etc.), and content can easily be copied.

This has led to a proliferation of unreliable websites that are increasingly difficult to distinguish from legitimate ones. The task force is actively committed to identifying these websites, blacklisting them and having them taken offline.

Jenike & Johanson uncovers the dynamics of covered storage structures



Enclosed storage structures must be designed to withstand both static and dynamic loads generated by the stored material.

By Senior Consultant, Dr. Jayant Khambekar, PhD, and Romit Vyas, Project Engineer, Jenike & Johanson

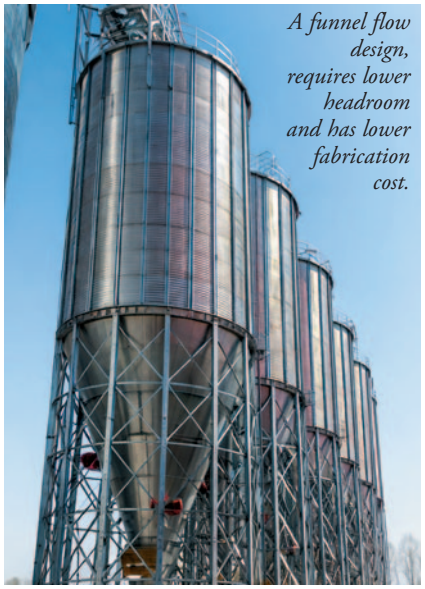
Storage of bulk solids can be classified under two main categories, which are 1) open and 2) closed forms of storage. As far as open storage is considered, imagine a stockpile or a small heap. Although open storage has low upfront cost, closed storage has several advantages when material behaviour, product quality, safety, or regulations matter more than lowest installation price. Examples of closed storage can be sub-categorized under gravity flow and non-gravity flow forms of storage. Non-gravity flow forms of storage consists of automatic stacker/reclaimer type systems. The automatic stacker/reclaimer type systems use mechanical reclaim and often require a noticeable footprint. They need significant CAPEX and have daily power consumption. That's why gravity flow type is preferred. Common gravity flow type of storage includes silos, bins and hoppers.

In a gravity flow based system, it is important to design the system properly such that gravity can do its work. The hopper shape, slope and outlet size are important features that need to be designed correctly, otherwise flow issues can occur. This is a critical aspect in several industries such as mining, chemical, glass, cement, biomass, pharmaceutical, and food. It requires one to effectively meet operational, material-flow, structural, and safety related criteria to prevent flow problems, degradation, and safety hazards.

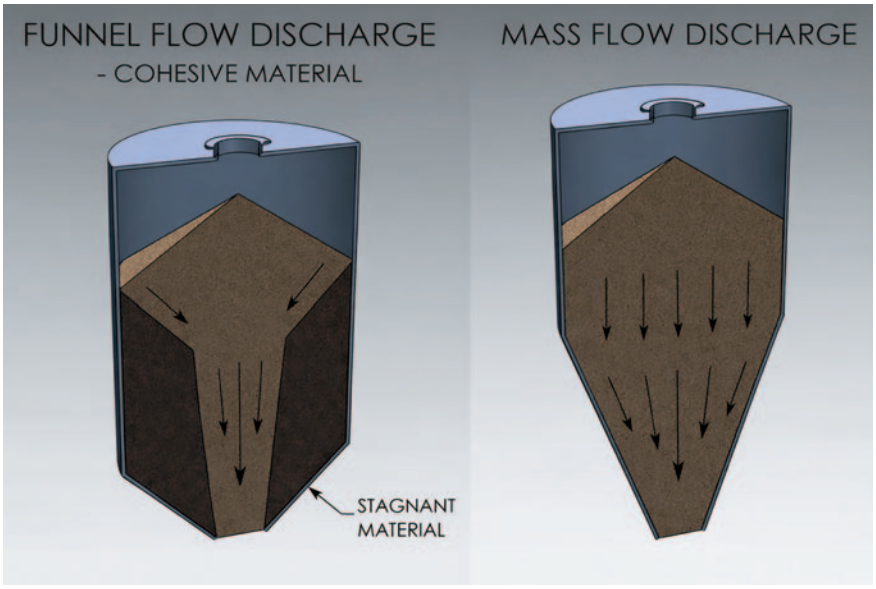
To begin with, designing a bulk solids storage system should be based on the understanding of the properties of the bulk solid being used. Particle characteristics, such as cohesiveness and friction between material and the silo/hopper walls, play a crucial role. Cohesive powders may arch or rathole if the outlet size is not large enough. Higher friction may require steeper hopper angles to achieve flow without stagnation. Free-flowing granular materials may segregate during filling and discharge. All these aspects must be considered during bin design.

Silo/hopper geometry plays a decisive role in reliable operation. A funnel flow design requires lower headroom and has lower fabrication cost. However, in funnel flow design, only some material is in motion during discharge while the remainder is stagnant. This leads to a first-in, last-out form of flow and possibility of flooding of fine powders causing erratic flow, caking, spoilage and segregation of fine and coarse components that may lead to an off spec product. Funnel flow pattern is suitable only if the bulk material is coarse, free flowing, does not degrade over time and segregation is not a concern. All of the above-mentioned criteria must be satisfied to justify a funnel flow design. Otherwise, storage vessels should be designed to achieve mass flow. In mass flow, all the material is in motion whenever there is discharge. Mass flow provides first-in, first-out flow, along with the elimination of any ratholing possibility. Furthermore, it minimizes segregation and gives a relief for fine powders allowing them to deaerate. To successfully achieve a mass flow design pattern, it is critical to determine flow characteristics of the bulk solid like cohesiveness, wall friction, compressibility, and permeability, through testing. Cohesive strength test is used to determine the hopper outlet size whereas wall friction test determines hopper angles for mass flow silos. Jenike's shear tester is the established way for conducting these tests.

Material handling methods strongly affect reliability, as poor inlet or discharge design can cause segregation, attrition, dusting, and/or flow problems; therefore, discharge equipment and flow aids must match the material's flow behaviour. Common solutions include mass flow hoppers with screw feeder, belt feeder or rotary valve. Flow aids such as vibrators, air pads, or mechanical agitators may be helpful in certain cases. Proper design



A funnel flow design, requires lower headroom and has lower fabrication cost.



ensures consistent material movement and predictable discharge rates. Finally, all storage systems must support routine inspection, cleaning, maintenance, and emergency response through proper access and clearly defined operating procedures to ensure long-term reliability.

Furthermore, enclosed storage structures must be designed to withstand both static and dynamic loads generated by the stored material. As per Dr. A. W. Jenike's Bulletin 123, bulk solids possess internal friction and they exert non-uniform pressures on silo walls and hoppers dissimilar to liquids. These pressures depend on material properties, filling methods, discharge behaviour, and wall friction. These pressures need to be calculated to avoid failure of silo/hopper due to material flow induced loads.

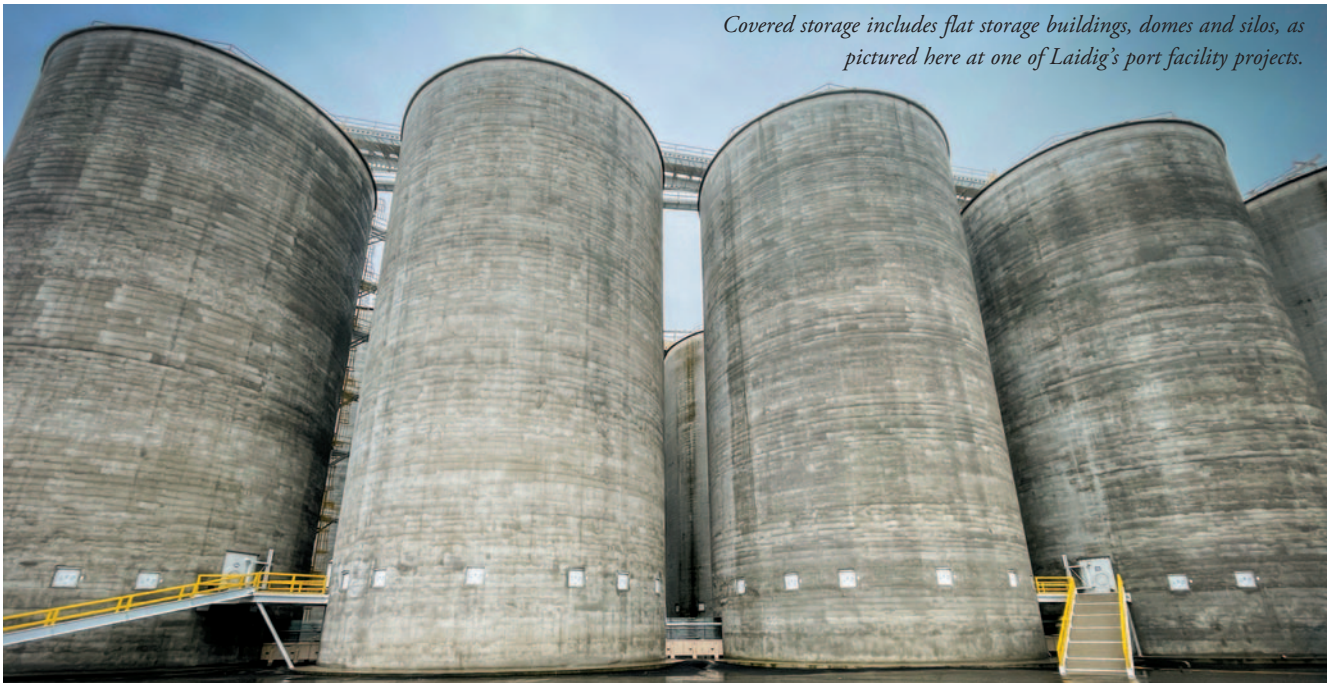
Safety and performance are critical in enclosed bulk solids storage, especially for fine or combustible powders where dust explosions and personnel hazards are major risks. Designs must consider dust collection, explosion protection, grounding and bonding, confined-space compliance, safe access, and overfill protection.

In conclusion, storing bulk solids in enclosed spaces is much more involved than simply containing material within a structure. Successful storage systems are engineered around the physical, chemical, and flow characteristics of the bulk solid while addressing structural integrity, environmental protection, safety, and regulatory compliance. Failures in enclosed bulk storage are most often traced to inadequate understanding of material behaviour, poor flow design, or insufficient hazard mitigation. By applying a comprehensive, criteria-based approach, industries can achieve safer operations, higher material quality, and reduced lifecycle costs.

Covered storage: methods, equipment, worker safety and material integrity

As material producers and logistics professionals optimize their operations for the ever-growing demand of dry bulk materials worldwide, many are looking for ways to protect their material at scale while keeping up with emerging trends like equipment automation, *writes Mandi Steffey, Sales Marketing Manager, Laidig Systems*. No matter what the material is, when volume grows, so does the need for hands-free storage and unloading technology to keep operating and labour costs low in a dynamic, changing marketplace.

As bulk storage technology and infrastructure continue to advance in different parts of the world, operational reliability and product quality remain among the top factors professionals consider when planning their storage and unloading processes. There's a need to not only protect the material from excessive moisture, cohesion, and infestation, but a need to do it better than ever before. Producers are looking for ways to protect



Covered storage includes flat storage buildings, domes and silos, as pictured here at one of Laidig's port facility projects.

their investment while providing year-round access to the material, improved throughput, and reduced downtime just to keep up with basic demand. With all of these factors at play, covered storage is no longer optional for many terminals and ports.

There are several different types of covered storage options being used today. These can include anything from a low-cost rectangular flat-storage building all the way up to more comprehensive options like concrete domes or large circular silos. Material volume, site space, unloading schedules, and cost all play a role in which options are the best fit for a particular application.

A popular option at global terminals is the flat-storage building. In this storage concept, all manner of materials are stored in a large pile underneath either a rectangular, hard-sided, roofed building or a fabric or long-span structure. This low-cost option tends to work in the short term, but it becomes practical and unsafe for workers in the long term.

Safety issues are one of the main drivers when it comes to looking at newer, more advanced storage and unloading systems. In flat-storage buildings, unloading is typically handled via human entry. Workers have to physically go inside the building and move the material via manual means like front-end loaders. What may seem like a simple concept is actually very risky: workers are exposed daily to dark conditions, dust, and unpredictable material known to be deadly under certain conditions. Because of the inherent dangers with this storage model, industry leaders are pushing toward full automation and zero-entry systems.

Domes and silos have the ability to eliminate some of that safety risk. When it comes to these structures, some may have hesitation because of the perceived difficulties involved with storing and unloading certain hard-to-handle materials like grain-based meals, biomass, and powders without manual intervention and agitation. When domes and silos are used for storage and there is not an appropriately powerful reclaim system integrated to handle those materials, the product can hard-pack and become bridged, rat-holed, or otherwise blocked inside the storage structure, making it difficult or impossible to load out for transport. Advancements in automation technology have effectively eliminated this worry, however.

Today, port facilities and large-scale producers alike are taking advantage of those technological advancements. Companies like Laidig Systems, Inc. specialize in 'screw-type', bottom silo and dome reclaimers that address many of the concerns associated with covered storage, including:

- automatic and continuous material reclaim;
- zero personnel entry; and
- ability to handle a wide range of materials including powders, flakes, biomass, and hard-to-flow meals.

Laidig specializes in aggressive, screw-type bottom reclaimers designed to start and operate under a full material load in a vertical silo, dome, or open material pile. The screw rotates about its own axis pulling material toward the center of the silo floor. At the same time, the screw slowly advances, sweeping around the entire silo floor. As material is brought to the center of the silo floor by the machine's powerful auger, it then flows down through a center chute below the floor and into a discharge auger or conveyor for transfer out of the silo.

The technology reduces and eliminates silo bridging and rat-holing, helps create mass flow, decreases the potential for product infestation, and maintains a first-in, first-out (FIFO) material distribution. It can also be equipped with remote technology that safeguards both material and equipment, providing constant monitoring and alerts to reduce problems and downtime.

Laidig reclaimers are used at terminals around the world, and companies with commodities at major ports have seen tangible operational improvements with the equipment. For example, in Brazil, one prominent exporter has reported great success with using Laidig reclaimers in very large cement silos storing soybean meal, a notoriously difficult-to-handle material. Laidig's equipment, along with its world-wide service and support, has been a key differentiator for the exporter.

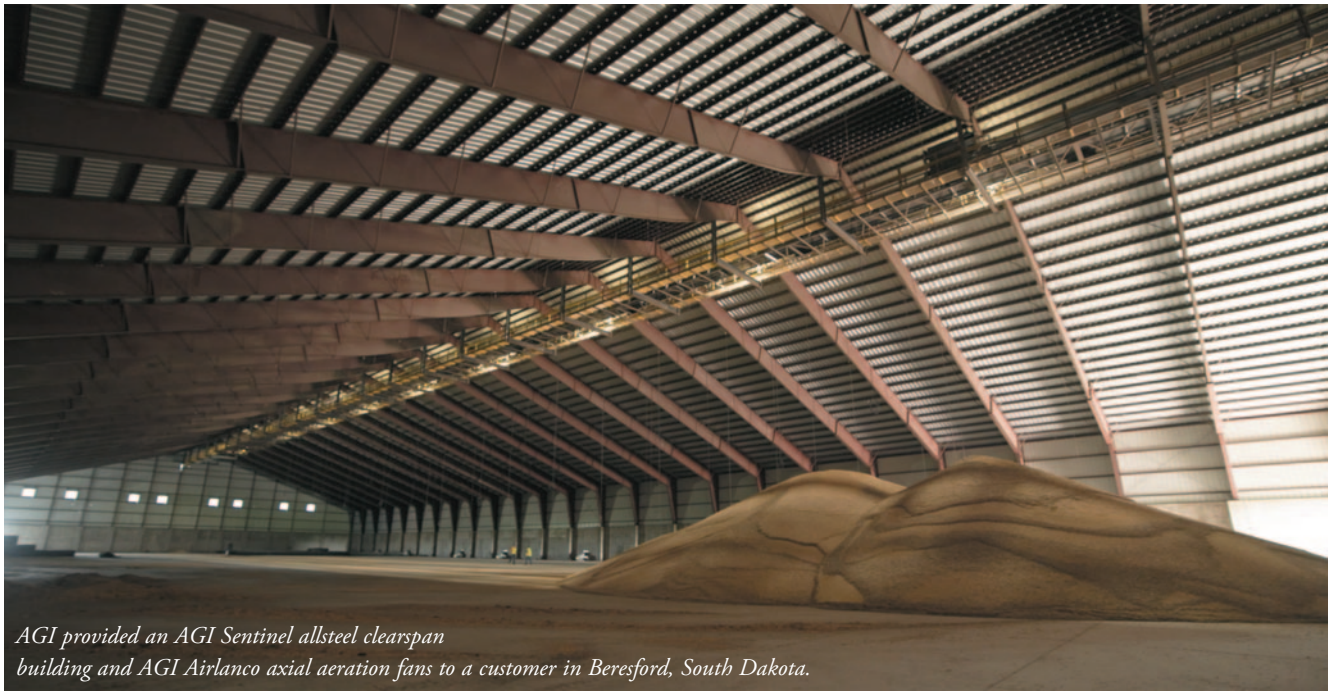
Reclaim technology is often the 'missing piece' that determines whether a covered storage operation performs as intended. That's why it's important that professionals look into every option available to them in an effort to balance environmental, operational, and economic performance over time.

About Laidig Systems

Laidig designs, engineers, fabricates, installs, and services custom storage and reclaim systems for vertical silos, domes, and other storage structures to provide complete 'turnkey' material handling solutions for hard-to-handle products. Laidig's experienced team has the knowledge and expertise necessary to provide silo unloading solutions for some of the most difficult material handling challenges in the world. Laidig's rugged systems provide aggressive reclaim of non-flowable and semi-flowable materials through consistent operation. Laidig reclaim systems can be installed in both flat and cone-bottom structures, and are capable of handling a wide range of storage and output capacities.

Laidig reclaim systems, pictured here, aggressively and automatically unload bulk material from covered storage buildings like silos and domes.

AGI case study: covered flat storage and aeration support grain and soybean storage at Farmers Coop Society



AGI provided an AGI Sentinel allsteel clearspan building and AGI Airlanco axial aeration fans to a customer in Beresford, South Dakota.

For grain operators managing large volumes through compressed harvest windows, maintaining grain quality remains a constant challenge. Covered flat storage, when paired with aeration, plays an important role in protecting stored grain while allowing operators to manage product during peak harvest periods.

A recent installation at Farmers Coop Society in Beresford, South Dakota, USA, illustrates how a covered flat storage building can be designed to support these objectives.

Project overview

Farmers Coop Society commissioned a 2.5 million bushel covered flat storage facility to store grain and soybeans during harvest and extended storage periods. The project centres on a 200ft by 500ft AGI Sentinel allsteel clearspan building, designed for flat storage applications.

The building is equipped with eighteen AGI Airlanco axial aeration fans, selected to provide airflow across the storage area. Together, the structure and aeration system were designed to protect grain quality during periods of high harvest activity.

Clearspan flat storage design

A defining feature of the installation is the clearspan design of the AGI Sentinel building. With no interior columns, the structure provides a fully open interior suited to flat storage of grain and soybeans, allowing equipment to move easily for grain placement, removal and inspection.

Aeration and grain management

Aeration is a key component of the flat storage system. The eighteen AGI Airlanco axial fans installed along the exterior of the building provide the airflow needed to manage grain conditions across the 2.5 million bushel storage area.

The contractor, J&D Construction, recommended the fans based on prior experience with Airlanco products, citing their reliability and durable construction. The aeration system provides airflow across the covered flat storage area to help maintain consistent conditions for both grain and soybeans during storage.

Conclusion

The Farmers Coop Society project in Beresford, South Dakota shows how a covered flat storage building can be designed to support grain and soybean storage. The 2.5 million bushel AGI Sentinel allsteel clearspan building equipped with Airlanco axial aeration fans, provides enclosed flat storage with the airflow needed to manage grain conditions during storage. DCi

Bulk flow through Netherlands ports

Louise Dodds-Ely

Throughput in the port of Rotterdam shows a slight decline

Steps taken towards more level playing field, improving investment climate remains necessary

- Cargo throughput down 1.7% — picked up in the second half of the year.
- Container throughput in TEU increased by 3.1%, decreased by 0.2% in tonnage.
- Greater focus on resilience of port complex due to changed security situation.
- Operating result for Port of Rotterdam Authority stable.

Throughput in the port of Rotterdam fell by 1.7% in 2025. This brought total throughput to 428.4mt (million tonnes). The largest decline of 6.5% occurred in the dry bulk segment. The liquid bulk segment saw a decline of 1.5%. Container throughput showed growth of 3.1% in TEU, reaching 14.2 million TEU. In terms of tonnage, container throughput decreased by 0.2%. In the second half of the year, signs of recovery were visible in all segments. Concerns about the lagging investment in industry by the business community remain high. Over the past twelve months, a number of chemical companies announced plans to close their factories in Rotterdam, and investments in new and ongoing projects have been halted, primarily in renewable fuels. The measures taken by the government in 2025 are positive, but insufficient to level the playing field in the Netherlands with that in Europe. Additionally, competition from countries such as China remains evident. The Port Authority's financial results remained stable. The Port Authority's investments amounted to €291.4 million.

Boudewijn Siemons, CEO of Port of Rotterdam Authority: "We look back on a challenging year, in which chemical and logistics companies in our port were under considerable pressure and European industry was affected by increasing global competition. All this took place against a backdrop of further escalating geopolitical tensions. It is precisely under such circumstances that a well-functioning port remains essential to the prosperity, economic development and strategic relevance of the Netherlands and Europe. A continued focus on resilience, agility and intensive co-operation at national and European level is crucial in this regard — both for the supply chain and for industry."

Making port and industry more sustainable

Although the Port of Rotterdam Authority

is aiming for a 55% reduction in CO_2 emissions by 2030, it is becoming increasingly unlikely that this target will be achieved in the port and industrial complex, as is the case nationally. The Port Authority therefore continues to work with companies to accelerate the reduction and is making every effort to encourage and support them.

In 2025, a large number of sustainability projects were launched and continued. Air Liquide has commenced construction of a plant for the production of green hydrogen. The hydrogen plant will have a capacity of 200MW and is scheduled to be operational by the end of 2027. The Air Liquide factory will be the second electrolyser on the Maasvlakte.

Shell's electrolyser, Holland Hydrogen I, will be commissioned at the end of 2026. The construction of the Porthos CCS project is now in its final phase. The installation of the 20-kilometre offshore pipeline has been completed. Porthos is expected to be operational by the end of 2026. The construction of the hydrogen network is also progressing steadily. The final section of the 32km hydrogen pipeline has been welded together. The final phase consists of preparations for commissioning. The network will ultimately connect the major industrial regions in the Netherlands, Germany, and Belgium.

City and port

At the end of 2025, the Municipality of Rotterdam and the Port of Rotterdam Authority published the Port Vision 2050. The vision, drawn up in collaboration with the government, Deltalinqs and the province of South Holland, outlines a Rotterdam port that will be the most competitive, sustainable and resilient in Europe by 2050. A port that is safe, innovative and of great value to the economy, strategic autonomy and the living environment. To achieve this, intensive public-private cooperation and a strong investment climate will be crucial in the coming years.

Since 2021, the Port Authority has made €1 million available annually for projects that contribute to improving the quality of the living environment in the immediate vicinity of the port area. Due to its popularity, the Port Environment Fund has been extended until 2030 and the annual contribution will be increased to €1.5 million.

The use of shore power also has a positive impact on the quality of the living environment, nature and the environment. In 2025, the Municipality of Rotterdam and the Port Authority drew up a new strategy for the expansion of shore power in the port in the period up to 2035.

In order to introduce the general public to the port in an interactive way, the Port Authority has invested in the Portlantis port experience centre. Portlantis opened in March and has since welcomed many visitors, including more than 13,000 schoolchildren, most of whom came from the Rotterdam region. Through a partnership with the Youth Education Fund, the Port Authority aims to increase the development opportunities of children in Rotterdam South who are growing up in poverty. In 2025, the Port Authority provided help to children some 15,000 times by supporting primary school pupils with educational materials, cultural and sporting activities, laptops and bicycles, for example.

Safety and resilience

The port of Rotterdam plays an important role as Europe's logistics hub. As a result of the changed security situation in the world, defence logistics may play a greater role in the port. For the port of Rotterdam, this means that a 15-hectare site on the Maasvlakte has been reserved for a terminal as part of the National Space for Defence Programme. Furthermore, amphibious exercises may take place on the beaches of the Maasvlakte.

In times of rising geopolitical tensions, cyber-attacks and drones are increasingly being used for undesirable and disruptive activities, such as sabotage, espionage or smuggling. The digital threat remains as significant as ever, which is why the Port Authority works structurally with Dutch seaports of national importance to strengthen the resilience of crucial digital processes. Reports of unknown drones flying over critical infrastructure in Europe and the Netherlands are also leading to increased vigilance in the port industrial complex. Careful planning of the low airspace is an important part of this. Significant steps were taken towards this goal by 2025. In 2026, the first phase of the development towards a fully U Space airspace will commence, in which drone flights will only be permitted under clear rules and with digital support. In addition to this regulation, the Port Authority is investing in technology to detect unwanted drones in a timely manner.

Investments and financials

The Port of Rotterdam Authority has had a stable financial year. The Port Authority's revenues rose by 6.6% to €940.4 million. The 4.5% increase in contract revenues is mainly due to indexation and a balance of various new and expiring contracts. Port dues rose by 7.9% in 2025. This is mainly due to indexation and a changed tariff structure and discounts.

Operating expenses increased by €38.3 million. This is mainly due to an increase of €13.6 million in personnel costs and €15.6 million in operating expenses. Personnel costs have increased due to the latest collective bargaining agreement changes. Operating costs increased partly due to changes in the IT activation policy in 2025. This is leading to an increase in operating costs and a decrease in investments. Additionally, the prices of many contracts with suppliers are higher due to indexation.

Earnings before interest, taxes, depreciation, and amortization (EBITDA) increased by 3.6% to €583.6 million. This amount is the yardstick for the Port Authority's capacity to continue investing in the development of the port industrial complex through its own balance sheet.

Net profit fell by €7.8 million to €266.0 million due to higher depreciation and a one-off impairment charge of €13 million relating to customer-specific assets.

The Port Authority invested €291.4 million in 2025. That is 9% less than in the same period last year. This is partly due to a change in the processing of automation costs and a one-off acquisition of nitrogen rights in 2024.

Due to new dividend agreements between the Port Authority and its shareholders, the dividend payout in 2025 will amount to €186.2 million. This payment amounts to 70% of the net result. The Port Authority and the shareholders have agreed that the dividend capacity depends on the planned investments and the financial position of the Port Authority.

Throughput

Dry bulk

The throughput of dry bulk fell by 6.5% in 2025. The throughput of iron ore and scrap decreased by 11.5%. Iron ore volumes in particular fell sharply as the competitive position of the European steel industry remains under pressure from high energy and CO_2 prices and cheap imports. Coal throughput fell by 8.7% to 17.3mt. This decline can be attributed to a sharp drop in demand for coking coal due to the weak position of European steel production. The transit of energy coal increased in the first half of the year due to too little wind and high electricity demand.

Coal-fired power stations in the Netherlands and Germany consequently operated for longer hours.

In the second half of the year, less coal was used for electricity generation, due to higher yields from renewable energy sources and falling gas prices.

The throughput of agribulk increased by 6.3%. Volumes were particularly strong in the first half of 2025. This growth is linked to the commissioning of a new dry bulk terminal in Rotterdam. The throughput of other dry bulk fell slightly by 1.6% to 12mt. Industrial production was under pressure, particularly in the first half of the year, leading to a decline in demand for raw materials. There was a slight upturn in the second half of the year.

Liquid bulk

The throughput of liquid bulk showed a slight decrease of 1.5%. Crude oil throughput increased by 3.4% to 101.2mt. The throughput of mineral oil products decreased by 12.6%. After a poor first half-year, throughput increased in the second half-year, especially in the last quarter. Oil products were mostly in backwardation and arbitrage opportunities were few and far between.

LNG throughput increased by 15.1% to 13.0mt.

The throughput of other liquid bulk decreased by 1.1mt to 34.3mt (–3.1%). This is mainly due to a significant decline in the throughput of chemical products, including methanol. The throughput of both ethanol and SAF increased. Biodiesel throughput also showed signs of recovery in the second half of the year.

Containers and breakbulk

Container throughput increased by 3.1% in TEU to 14.2 million TEU. In terms of tonnage, throughput decreased by 0.2%. Throughput fluctuated due to poor weather conditions and strikes at the beginning and end of the year.

The growth in TEU can be explained by the 9.3% increase in import volumes from Asia. In the second half of the year, imports rose more sharply than in the first half. More import containers, lower export volumes due to the deteriorating European competitive position and the decline in transshipment have led to more throughput of empty containers. Throughput to and from North America also continued to increase in the second half of the year, resulting in growth of 13.6%. Changes in the alliance structure of shipping companies have led to an increase in the number of services. Due to congestion in the handling of containers at the quays, a significant amount of throughput volume has been diverted to other ports. This segment shows a decrease of 15.9% in TEU. Shortsea volumes have remained stable.

RoRo throughput increased by 0.9% to 25.6 million tonnes. Volumes to and from the United Kingdom are growing at a limited rate due to low economic growth in this important market. Other breakbulk increased by 4.6% to 6.1mt. The increase in throughput is due to higher throughput of steel products, the delivery of offshore wind foundations, steel pipes for the Porthos project and an increase in aluminium, which is being sold more to companies in Europe due to import tariffs in the United States.

Port Authority advocates consistent, long-term policy to stimulate investment climate

In recent years, the Port Authority has worked hard, together with governing bodies, grid operators and businesses, to improve the playing field for Dutch industry in relation to neighbouring countries. Initial steps have been taken: the plastic levy has been scrapped, the Indirect Cost Compensation ETS (IKC ETS) scheme has been reinstated, the Dutch CO_2 levy on top of the European ETS has been suspended, and a decision has been made on the correction factor for renewable hydrogen in refineries.

However, major bottlenecks remain, such as nitrogen issues, grid congestion, high energy costs and higher grid tariffs compared to neighbouring countries.

The new coalition agreement demonstrates that the coalition parties are committed to addressing these urgent issues, which are essential to the Netherlands' competitiveness, future earning capacity and strategic relevance. The Port of Rotterdam Authority is keen to work with the new government as soon as possible on the concrete elaboration and implementation of the necessary measures. For example, the coalition parties' commitment to bespoke solutions for clusters to make industry more sustainable.

The Netherlands benefits from investments in the future and from consistent, long-term policies that encourage companies to invest in sustainability. This is crucial for a healthy economy and, therefore, for the prosperity and resilience of the Netherlands. In addition to its own investments in the port of Rotterdam, the Port Authority will continue to commit itself to ensuring the availability of sufficient resources for strategic industrial policy and infrastructure, such as the renewal and maintenance of roads, railways and waterways.

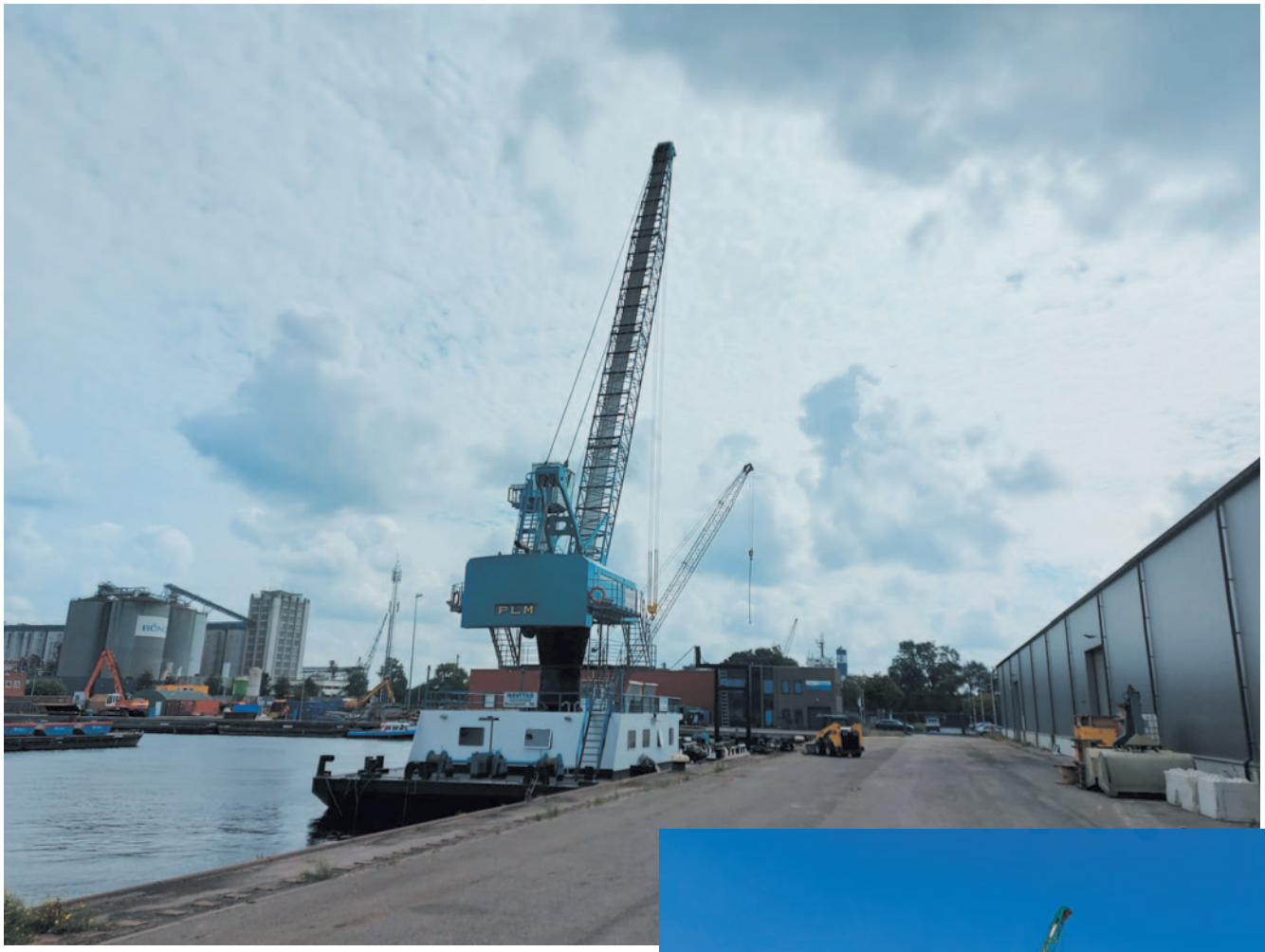
About the port of Rotterdam

The port of Rotterdam creates significant economic and social value in the Rotterdam-Rijnmond region, the Netherlands and Europe through employment and security of supply of energy, food and other products needed in society. Thanks to the favourable location, excellent infrastructure and hinterland connections, the port serves as an important hub for industry and global trade.

The Port of Rotterdam Authority's core tasks are the sustainable development, management and operation of the port and industrial complex and maintaining the effective, safe and efficient handling of shipping in the port and the offshore approaches to the port. The aim of the Port of Rotterdam Authority is to strengthen the port's position as a future-proof logistics hub and industrial complex. Quality is central to this. The Port Authority's ambition is to develop a climate-neutral port that is in harmony with its surroundings.

Facts and figures from the Port of Rotterdam Authority and the port of Rotterdam (2025): Port of Rotterdam Authority: approximately 1,440 employees, revenue approximately €940 million and gross investments €291 million. Port area: 12,500 ha of port area (land and water, of which over 6,000 ha is industrial sites). Length of the port area: over 40km. Cargo throughput: approximately 428mt of freight a year. Shipping: approximately 27,384 seagoing vessels and 93,680 inland vessels annually. Employment: approximately 182,000 jobs (directly and indirectly in Rotterdam-Rijnmond). Added value: €23.3 billion, 2.2% of the Dutch GDP.

Maja Stuwadoors acquires floating crane 'Navitas' and pusher boat 'Caritas'



Maja Stuwadoors BV strengthens its position in the port of Amsterdam in the Netherlands

Logistics service provider Maja Stuwadoors BV announced in mid-December 2026 that it is taking over the floating crane *Navitas* from entrepreneur Johan Speksnijder. With this transaction, Maja Stuwadoors strengthens its position in Amsterdam port logistics and further expands its range of service.

Maja had been looking for a new floating crane for some time in order to continue to provide flexible and reliable services in the future, core values of the company. During this search, Majaa came into contact with Johan Speksnijder, which resulted in the purchase of his PLM type 1227 crane.

The crane has been thoroughly updated very recently, including a new crane arm and a wider pontoon. PLM designs and builds custom cranes that function excellently. "We are therefore very pleased to be able to add such a crane to our fleet," said a representative of Maja.

The integration of the *Navitas* into the activities of Maja Stuwadoors is expected to be completed in the first half of this year. Financial details of the transaction were not disclosed.

With this move, Maja Stuwadoors underlines its ambition to play a prominent role in the logistics sector and to respond to the increasing demand for efficient and sustainable solutions.

About Maja Stuwadoors BV

Since 1972, Maja Stuwadoors has been a household name in the world of storage and transshipment. The business — part of August Bolten/Nova Marine and Ership Grupo — distinguishes itself through flexibility, speed and a compact organization. From its head office in Amsterdam, the organization is managed with a great deal of passion for the stevedoring trade. Atmosphere, freedom and short lines are characteristic of its team of over 40 well-trained and motivated employees.

Mibau-Stema Nederland B.V. strengthens its position in the Dutch market with a new terminal in Amsterdam and focus on knowledge partnership

Mibau Stema Group, a prominent supplier of aggregates for the construction and infrastructure sectors, has announced the development of a second terminal in the Afrikahaven in Amsterdam. With this strategic expansion, the company strengthens its position in the Dutch market and takes an important step in its long-term strategy focused on growth, sustainability, and knowledge sharing. This step is part of the further expansion of production capacity at our production sites in Norway. From mid-2026, approximately two million additional tonnes will be available to meet future demand for high-quality construction raw materials.

The Afrikahaven in Amsterdam, where Mibau-Stema Nederland B.V. is developing its second terminal; the new terminal area is visible in the background.

New second terminal in Afrikahaven

In co-operation with Port of Amsterdam, Mibau Stema Nederland B.V. has acquired a new terminal of approximately 50,000m² in the Afrikahaven. The terminal is expected to become operational by the end of Q2 or in early Q3 – 2026.

The location features a completely new quay with a dredged water depth of 13.5 metres, enabling the two newest, future self-discharging vessels of the Mibau Stema Group to berth without any restrictions. These vessels achieve a CO_2 reduction of approximately 100% due to fuel, further underlining the group's sustainability ambitions.

Future vision and growth strategy

The new terminal forms an essential pillar of Mibau Stema Nederland B.V.'s future growth strategy. This strategy is partly driven by the completion of the Grensmaas project in 2026 and the expected structural decline in the supply of construction aggregates from North Rhine-Westphalia (NRW).

In addition, the introduction of Granobase® plays an important role. This innovative product concept forms the basis for new applications and solutions and contributes to further distinctive market positioning. With this, Mibau Stema Nederland B.V. increases its visibility among government bodies and engineering consultancies and explicitly develops as a full-fledged knowledge partner within the Dutch civil engineering sector (GWW).

Said Frank Holzapfel, Managing Director Mibau-Stema Nederland B.V., "When I started alone in 2009 at what was then Mibau Nederland B.V., we had one terminal of 17,000m² in the Suezhaven. That was sufficient at the time to achieve our first goal: building a solid network of relationships and introducing high-quality aggregates to the Dutch market.

"With this new site, we are ready to respond to future market developments and have sufficient capacity to ensure continuity of supply to our customers in the long term.

"With this new terminal and our sustainable innovations in shipping, we are taking a big step toward the future as a supplier of construction aggregates for a more sustainable society," Holzapfel concludes.

Said Koen Overtoom, CEO of Port of Amsterdam, said, "We are pleased with the arrival of Mibau Stema Nederland B.V.'s own terminal in the Afrikahaven. They have been a valued customer for many years and until now made use of a third-party terminal. The decision to establish their own loading and transshipment facility underlines their commitment to the port and their long-term ambition to use Amsterdam as an import hub. From this terminal, Mibau Stema Nederland B.V. can serve the market via sea and inland shipping, road, and rail.

"This multimodal approach and the focus on sustainable operations align well with the working methods and strategy of Port of Amsterdam," said Overtoom.

About Mibau Stema Group

Rock solid business

Mibau Stema Group is a respected European supplier of sustainable aggregates for the construction industry. From its three quarries, including Europe's largest in Jelsa, Norway, it extracts around 17 million tonnes of high-quality crushed rock each year for major infrastructure projects.

Its modern self-discharging vessels and 40+ terminals along the North and Baltic Seas ensure fast, efficient delivery. With over 500 employees in seven countries, Mibau Stema Group is committed to innovative rock solutions, sustainable resource use, and environmental protection.

About Mibau Stema Nederland B.V.

Mibau Stema Nederland B.V. is part of the Mibau Stema Group and supplies aggregates from international quarries to the Dutch market. From its storage terminal in Amsterdam, high-quality construction materials are distributed throughout the Netherlands via inland shipping, trucks, and rail. The company stands for fast, accurate delivery of large volumes to the right location.

'We are building a future proof HES, step by step': interview with Paul van Gelder, CEO of HES International

HES Bulk Terminal, Rotterdam.

Paul van Gelder, CEO of HES International.

HES International is one of Europe's largest independent bulk handling companies for liquid, dry, and breakbulk products. In a January interview, Paul van Gelder, CEO of HES International gave an insight into what 2025 represented for the company, and what we can expect in 2026.

Question: *the year 2025 was a significant one for HES International. How do you look back on the past year?*

Paul van Gelder: "The year 2025 was transformative in many ways. Our industry is evolving at pace, and that requires clear direction combined with tangible action. Over the past year, HES International demonstrated that we are not only adapting to change, but actively helping to shape it. The focus was on laying strong foundations: for new energies, for decarbonization, for long term resilience, and for one unified HES."

Q: *Which developments stood out most to you?*
PvG: "Two important achievements stood out for me. In France we acquired a new terminal, HES Fos. This terminal is a stepping stone for developments in the field of Green Steel. Decarbonized steel production will contribute to Europe's strategic autonomy. It's crucial to have our own steel production in Europe. Another important milestones was achieved at HES Wilhelmshaven Tank Terminal, where we secured the option to connect to Germany's hydrogen backbone via the Wilhelmshaven Coastal Line. This goes far beyond a technical connection. It is a concrete step towards positioning the terminal as a New Energies Hub and enabling large scale hydrogen imports into the German market. At a time when Europe is accelerating its energy transition, having the right infrastructure in place is critical."

Q: *Decarbonization plays a central role in your strategy. How is HES putting this into practice?*
PvG: "At HES, decarbonization is about action, not ambition alone. Together with Harbour Energy, we took the next step in our Carbon Capture and Storage cooperation, developing practical solutions to capture and permanently store CO_2 emissions from industrial sources. This partnership is an important milestone in reducing the carbon footprint of our sector and in supporting Europe's climate goals with scalable solutions."

Q: *Your activities extend beyond hydrogen and CCS. What else is happening in the energy transition space?*
PvG: "In France, our newly established subsidiary HES Med Terminals signed a Memorandum of Understanding with GravitHy. Together we will develop the port infrastructure linking GravitHy's future industrial site in Fos sur Mer to our dry bulk terminal. This project clearly illustrates the vital role ports play in enabling new industrial ecosystems, particularly those focused on green steel production and low carbon value chains."

Q: *How do you balance long term investments with day to day operational excellence?*
PvG: "Operational excellence is the foundation of everything we do. At HES Bulk Terminal Rotterdam, the team completed the full modernization of the train loading station; a key asset that has been in operation since 1976 and handles up to six million tonnes of iron ore per year. By putting safety first and embracing automation, we now operate a more efficient and future-proof system that continues to meet our customers' evolving needs."

Following the successful opening of the new Warehouse No. 32 in May 2025 – a state-of-the-art flat grain storage facility with a capacity of 64,000 tonnes – HES Gdynia has now commissioned three new grain silos with a combined storage capacity of 21,000 tonnes.

Q: *Were there other milestones within your bulk terminals?*

PvG: "Yes. In Poland, HES Gdynia Bulk Terminal reached a major milestone with the official opening of a new, fully automated flat grain warehouse*. This investment significantly increases our agricultural storage and handling capacity, reinforcing our position as a reliable partner within the agri bulk supply chain."

Q: *The year 2025 also marked an important step towards 'One HES'. What does that mean in practice?*

PvG: "As of 2 April, EMO B.V. and European Bulk Services officially rebranded under the HES International name. EMO is now HES Bulk Terminal Rotterdam, and EBS has become HES Bulk Terminal Maasdelta. This change is about much more than a new name or visual identity. It reflects a shared culture, aligned standards and a clear promise to our customers: wherever you engage with us, you engage with one HES. In December, SOSERSID SOMARSID also transitioned to HES Med Terminals, further strengthening our international alignment."

Q: *How important are relationships and engagement with customers?*

PvG: "Extremely important. Beyond projects and investments, 2025 reminded us of the value of personal connection. Hosting our clients at HES Bulk Terminal Amsterdam during SAIL Amsterdam 2025 was a fantastic opportunity to step away from daily operations and have open discussions about the future of our industry — in the setting of one of the world's most iconic maritime events."

Q: *Looking ahead, what are you most excited about in 2026?*

PvG: "From January 2026, 65% of the storage capacity at HES Botlek Tank Terminal will be dedicated to biofuels, surpassing our strategic target more than two years ahead of schedule. This milestone reflects both market demand and our ambition to actively support the transition to renewable fuels. We will also introduce new products at HBTA, further increasing the terminal's flexibility and relevance in a rapidly changing energy landscape. At the same time, we are accelerating our New Energies initiatives, supported by a new brochure that clearly outlines how HES enables hydrogen, CCS, biofuels and other emerging energy carriers across our terminal network."

Q: *Finally, what gives you confidence as you look to the future?*

PvG: "What truly makes the difference is our people, our partners and the trust our customers place in us. I am proud of what we have achieved together, not only in terms of projects delivered, but in building an organization that is resilient, future oriented and purpose driven. As we move into 2026, our direction is clear: operate safely, invest responsibly, innovate pragmatically and lead the transition where it truly matters; at the interface of industry, logistics and energy."

About Paul van Gelder

Paul van Gelder brings a wealth of experience to HES International, having successfully led large organizations in previous C-level roles. His extensive background includes leadership positions at prominent companies such as Gasunie, Eriks and Royal Imtech. Most recently, van Gelder served as CEO of Mammoet, the global leader in heavy lifting and transport services.

About HES International

HES International is one of Europe's largest independent bulk handling companies for liquid, dry, and breakbulk products. Its companies hold a unique independent position in the supply chain of bulk goods for a wide range of products providing first class access to Europe's deep draught terminals and excellent hinterland connectivity by barge, rail and truck. With 14 terminals in four countries at strategic located ports in Europe, HES International is an important switch in the continuous delivery of essential building blocks for everyday life needed to develop, sustain and improve the world around us. The company's professional staff ensure that bulk commodities are safely stored, handled and processed 24/7 for customers from all corners of the globe. HES International has a strong ambition to further broaden its product portfolio and also wants to respond optimally to the opportunities that the energy transition offers us.

HES International is headquartered in Rotterdam and has already been carefully handling bulk raw materials since 1908. Macquarie Asset Management, via Macquarie European Infrastructure Fund 5, and West Street Infrastructure Partners III, managed by the Goldman Sachs Asset Management Infrastructure business, each indirectly control 50% of the shares of HES International B.V.

For more details on the new grain warehouse, see 'HES Gdynia marks completion of major agro investment,' the first article in our feature on Enclosed Storage, entitled 'Put a lid on it,' in the September 2025 issue of Dry Cargo International. Ed.

North Sea Port cargo transhipment to increase slightly again in 2025

CEO Cas König calls for accelerated realization of port infrastructure

In 2025, companies in North Sea Port recorded a cargo transshipment via sea transport of 67mt (million tonnes). The growth in dry and liquid bulk in particular led to a slight increase of +0.4% for the second year in a row. The United Kingdom remains the most important trading partner. In order to maintain its position as a leading European port, CEO Cas König calls on the business and political world to accelerate the realization of port infrastructure.

Thanks to a strong fourth quarter, goods transshipment in 2025 increased compared to 2024. That year also saw a slight increase, but 2025 clearly confirms the port's resilience.

North Sea Port is and remains a bulk port

The slight increase is thanks to North Sea Port's unique position as a bulk port: both dry bulk and liquid bulk transhipment increased. Together, they still account for no less than three-quarters of maritime goods transhipment and continue to form a crucial buffer in times of uncertainty.

Dry bulk increased for the second year in a row (+2.1%) and continues to represent more than half (55%) of transshipment. The increase is mainly due to iron ore, fertilizers and scrap metal. However, there has been a decline in products for the construction sector (less sand, gravel and clay, cement and lime). Liquid bulk transshipment increased (+1.9%) and accounts for more than a fifth of total maritime transhipment (22%) thanks to the increase in biofuels, urea, animal oils and fats, and kerosene. In recent years, however, there has been a decline in raw materials for the chemical industry. Breakbulk declined (–8.7%), partly due to fewer machines, engines and appliances, and unprocessed paper and cardboard. This segment continues to account for 14% of transshipment. The transshipment of rolling stock, ro/ro, remains at the same level for the fifth year and accounts for the same share of goods transhipment (6%). Container transshipment grew in tonnes (+7.8%). The share of containers in transshipment remains the same (3%).

The ratio of imports to exports in maritime transshipment is 70% to 30%, with the share of exports increasing slightly over the years.

Great Britain once again the most important trading partner

In 2025, Great Britain once again took the top spot as North Sea Port's most important trading partner. The very strong increase in trade with Canada (+30%), which puts it in second place, is striking. North Sea Port has been working closely with several Canadian ports since 2018. Trade with the United States declined for the third year in a row (–3.7%), putting the USA in third place.

Exports to Russia have almost completely come to a standstill. Imports concern goods that are not subject to EU sanctions.

Inland waterway transshipment declines

Transshipment via inland waterways declined by 4.3% in 2025, after experiencing substantial growth of several percent in 2024. No less than 60% of all freight transport between North Sea Port and the European hinterland still takes place via inland waterways.

The total transshipment for maritime shipping (67mt) and inland shipping (61.5mt) in North Sea Port will then be 128.5mt.

Businesses and politics: accelerate the realization of port infrastructure

Today, North Sea Port already occupies a strong position within Western Europe. Maintaining and strengthening that impact and position requires, above all, future-oriented port infrastructure. North Sea Port is considering improving the nautical accessibility of the Ghent–Terneuzen Canal for larger ships, so that the opportunities for shipping created by the New Lock can be exploited to the full. This involves deepening the first 1.5km of the Canal to the Massagoedhaven (a dock) in Terneuzen for deeper-draught vessels, as well as making the necessary adjustments to allow wider vessels to sail safely to Ghent.

But the story does not end on the water. The construction of a new railway line between Ghent and Terneuzen, along the right bank of the Canal, is a strategic lever for sustainable logistics and competitiveness. In addition, North Sea Port is building a port with a strong energy mix: offshore wind farms and their landing points, pipelines for the transport of hydrogen and CO_2, among other things, and targeted investments in sustainability projects that reconcile industry and climate ambitions.

König said, "Once the infrastructure is in place, the economy will follow. That is why we are making this clear appeal. To businesses: keep investing, dare to look ahead and realize the plans that are already on the table today. To politicians: take the necessary decisions to further expand the port infrastructure and ensure an efficient, stable and decisive licensing policy. It is important that we then involve the surrounding area in the developments in such a way that investments are not only licensed, but also actually awarded."

And where there is growth, safety must also be a priority. Physical security for businesses, the fight against subversion and drug-related crime, attention to military security and cybersecurity are not peripheral conditions, but the foundations of a future-proof port.

This ambition is clearly present in Flanders, where the powers of 'Ports' and 'Industry' have been specifically assigned to a member of the government. Perhaps this could be an inspiration for the new Dutch government?

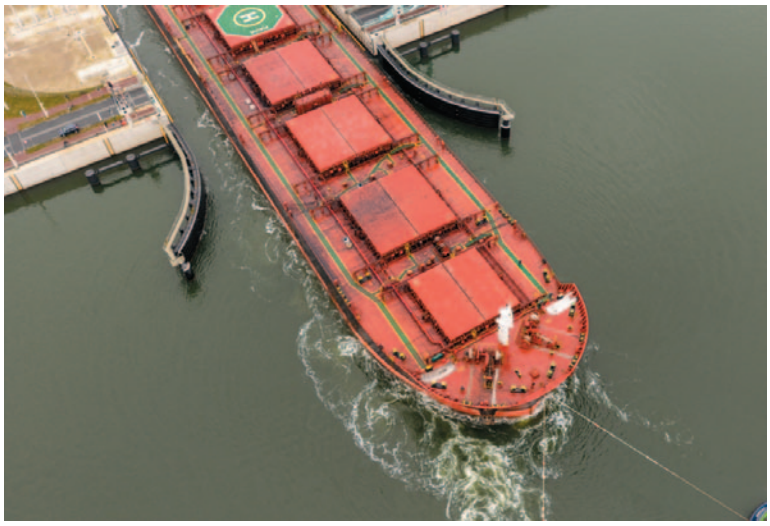
By working together across borders and accelerating the realization of port infrastructure, North Sea Port can maintain and strengthen its role as a leading European port. A port that seizes opportunities on European transport corridors, strengthens chain connections, anchors employment and prosperity in the region, and grows in a targeted manner towards becoming a climate-neutral and safe port.

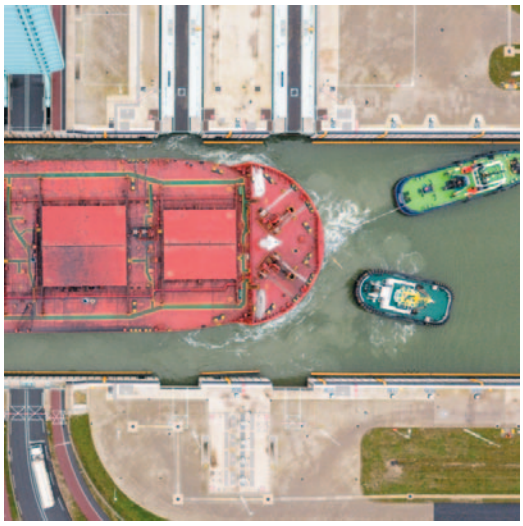
The ambition is clear. Now it is time to realize it together.

New Terneuzen Lock: commercial trial voyage with wider ship to ArcelorMittal

The New Lock in Terneuzen has been operational since 1 August 2025. Now a new phase has begun: on 29 December, a commercial trial voyage with a wider seagoing vessel took place on the Ghent-Terneuzen Canal, to ArcelorMittal in Ghent. This trial voyage is an important step in the further optimization of North Sea Port's nautical accessibility.

It was the ship *PIAVIA*, with a width of 38.04 metres — one metre more than the current permitted ship size on the Canal —





and a length of 229,20 metres, that sailed through the New Lock in North Sea Port on 29 December.

From theory to practice

The preparations for this trial voyage were thorough and intensive. Over the past two years, the Flemish–Dutch Scheldt Commission (VNSC), together with North Sea Port, the Joint Nautical Management (GNB) and the Flemish and Dutch Pilotage Authorities, carried out extensive studies. These included nautical simulations of the Ghent–Terneuzen Canal, in which pilots virtually steered the ship in a simulated environment with realistic conditions such as wind, water levels and bottom profiles. The impact on tow forces was also investigated.

Annick De Ridder, Flemish Minister for Mobility, Public Works, Ports and Sport, said: "This trial voyage demonstrates how important investments in our ports are for a strong economy. By bringing larger and wider ships to our industry more smoothly, we are making transport more efficient and cheaper. In this way, we are strengthening the international position of our ports, giving our companies more clout and ensuring that industry and jobs can continue to grow here."

The aim of the trial voyage was to put theory into practice and see how it works. Cas König, CEO of North Sea Port: "This provides valuable insights into the practical feasibility of wider and longer ships on the Channel and contributes to the development of our future-oriented infrastructure in the port."

The ship's final destination was ArcelorMittal Belgium in Ghent. "The ship has commercial cargo on board that will be unloaded at our quay," said Frederik Van De Velde, CEO of the ArcelorMittal Belgium steelworks. "This allows us to test how a larger, wider ship can sail up to our quay and what this means for our people on shore. The more cargo we can transport in one go, the more sustainable and cost-effective our steel production is."

Optimizing the canal: ships that are partly deeper but mainly wider

The New Lock was built to accommodate the large ships that can sail through the Panama Canal. Thanks to the New Lock, these larger and wider ships will be able to sail on the Canal towards Terneuzen and Ghent in the future, which will strengthen North Sea Port's international accessibility. North Sea Port therefore wants to further optimize the Ghent–Terneuzen Canal to give larger ships efficient access to the hinterland. This first trial voyage is an important step in this direction.

"As the North Sea Port authority, we make no secret of the fact that we would very much like to see a deeper canal with a draught of 14.5m for ships, extending to the Bulk Port in Terneuzen,' says König. This is about two kilometres beyond the lock and is technically feasible to deepen in the short term. This would mean that seagoing vessels would no longer have to lighten part of their cargo on the Westerschelde in order to sail into the Channel via the New Lock. Unloading could then be carried out more safely and cheaply at this bulk cargo port. "The port authority is also looking forward to sailing 43-metre-wide ships from the New Lock to the Kluizendok and Rodenhuizedok in Ghent." For a single ship transporting dry or liquid bulk, this quickly adds up to cost savings of several hundred thousand euros.

Flemish-Dutch Summit

This ambition of North Sea Port has already been confirmed by the Netherlands and Flanders. "The New Lock in Terneuzen also makes the accessibility of the ports of North Sea Port ready for the future.

In the coming years, Flanders and the Netherlands will discuss in the Flemish–Dutch Scheldt Commission how they can improve the nautical accessibility of the Ghent–Terneuzen Canal for larger ships, so that the opportunities for shipping created by the lock can be maximized,' was the message on 1 April 2025 at the Flemish-Dutch Summit in Ghent.

OVET: strategically positioned within ARAG

OVET, a dry bulk terminal located in the southwest of the Netherlands with two terminals on both sides of the estuary Western Scheldt, looks to the future with a curious eye. For both terminals there are several important developments having a significant impact on the functioning of the terminals.

For the terminal in Terneuzen, located just behind the sea locks along the canal of Ghent to Terneuzen, there are two important developments upcoming in near future: deepening the section of the canal just behind the locks, up to Post Panamax size and the optimization of the Scheldt-Seine connection.

Increasing the water depth of the canal, will most likely take place in the coming years. The new lock has officially been opened in October 2024, after seven years of reconstruction by which the dimensions of the lock have been expanded to:

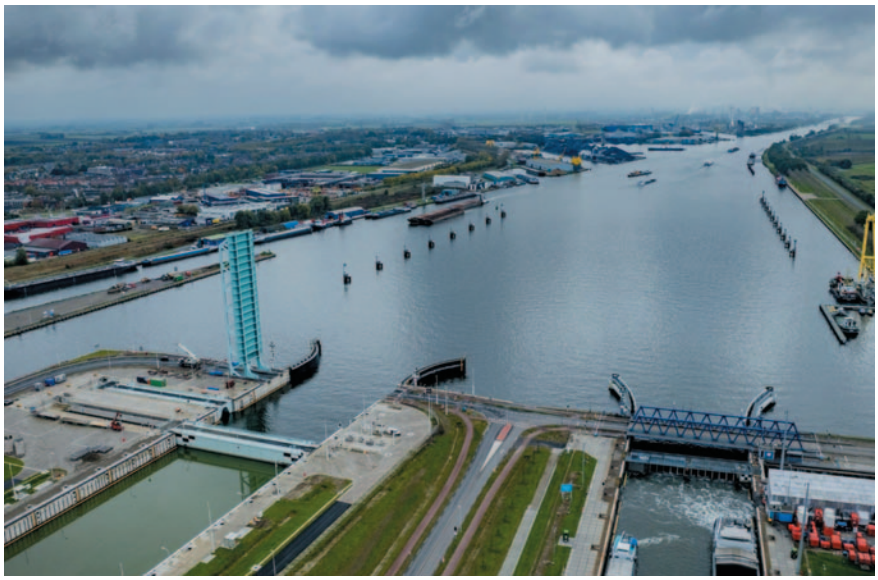
- a length of 427 metres;
- a width of 55 metres;
- a depth of 16,44 metres; and
- accommodating vessels up to 14.5 metres draught.

With these dimensions, the new lock ranks among the largest locks in the world, similar to the Panama Canal.

However, despite the water depth of the lock being expanded, this does not automatically imply that the water depth of the canal can accommodate vessels with a bigger draught. To achieve this, the canal needs to be dredged and the banks need to be strengthened to be able to deal with stronger waves.

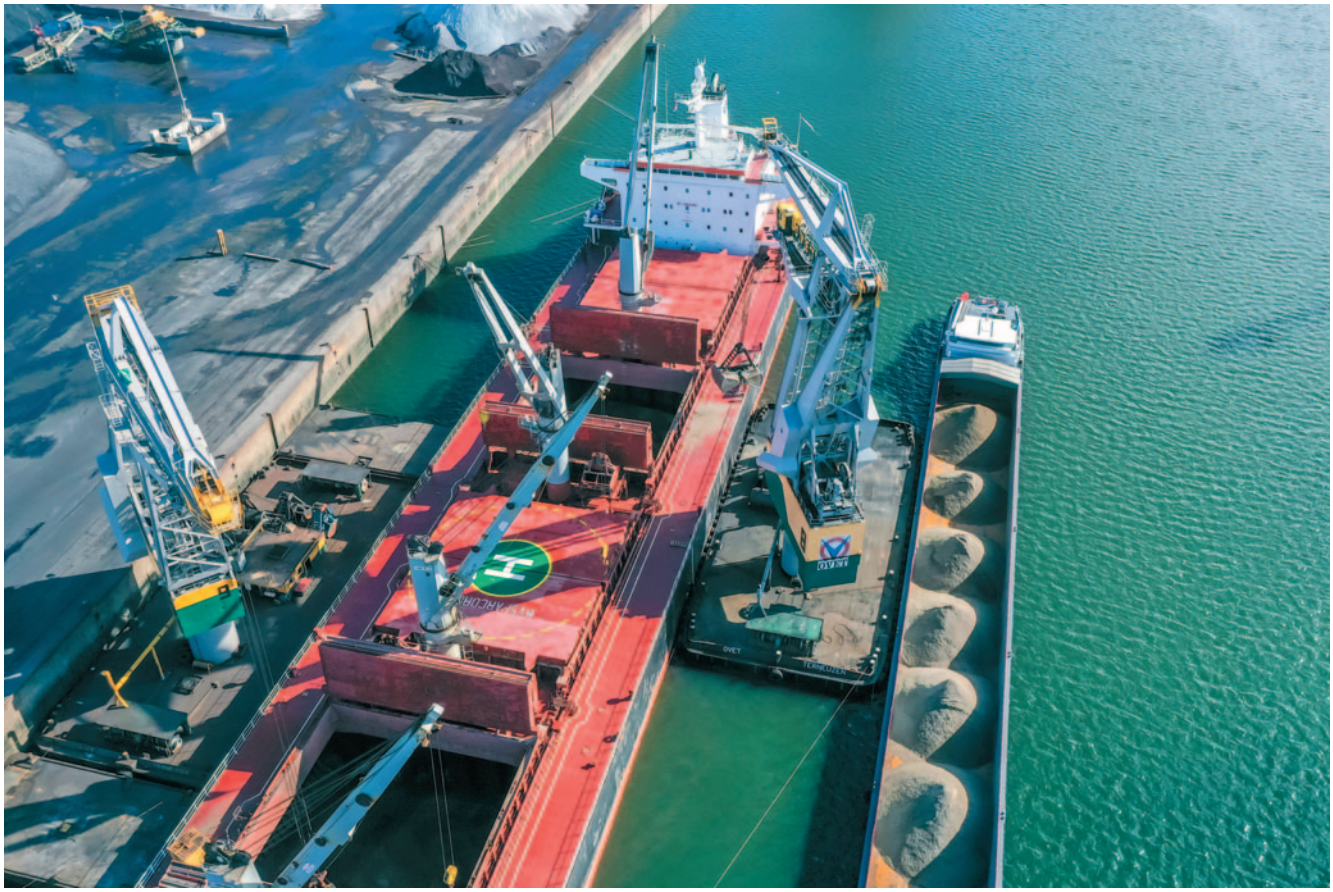
Modifying the whole canal structure will require an immense investment, resulting in its implementation to be carried out in sub projects, starting with the first part of the canal from Ghent to Terneuzen where the OVET terminal Massagoedhaven is located. This first part will be dredged in order to reach a draught allowing vessels with a draught of 14.5 metres fresh water, to enter the OVET berth.

With the extension of the draught, it will be possible to receive fully loaded Post Panamax vessels for discharging different types of dry bulk materials alongside the quay of the OVET terminal in Terneuzen. Instead of discharging at the quay, another option also will be to perform a direct transshipment with OVET's floating cranes, enabling vessels that need to discharge at a location located further along the canal, to continue their way with a draught of 12.5 metres after being lightered. Currently, vessels with too much draught, need to be lightered at the anchorages of the estuary Western Scheldt.



It is expected that the deepening of the canal, from sea locks until the first point of rest being OVET Terneuzen terminal, will be completed around 2030.

A second infrastructural development of importance is the Seine-Scheldt connection, which is a big TEN-T-project being executed. The project shall connect a number of European ports with each other, among which Vlissingen and Terneuzen, by existing and to be improved water ways as well as a to be dug canal.



These inland waterways will accommodate river barges, categorized by CEMT as class Vb being up to 4,400 metric tonnes connecting regions around the Seine with those of the Scheldt. This development will mean that the terminals of OVET, located at the entrance between the River Scheldt and the canal of Terneuzen to Ghent, will be very well positioned for cargoes that arrive with sea vessels and need to be transferred onto substantial sized river barges with end destinations deep into France or vice versa. This could work via a direct transfer from sea vessel into barges or via a transfer by use of the storage space at the quay of OVET.

Another interesting development to OVET is the focus on the green-transition by the steel industry. OVET has a strong focus on the handling of metallic raw materials such as DRI (Direct Reduced Iron) and different types of scrap. Handling different types of DRI requires a careful approach to dust, contamination with water and possible heating-up of stockpiles. Over the past years, OVET has gained extensive experience and expertise in handling this product category and therefore knows well how to handle and store this product category in a safe and efficient way.

A metallic cargo in the same category is steel scrap; this fits in the green transition of the steel industry whereby the higher quality scrap is being imported into the ARA region instead of being exported, and being used as a feedstock to the existing and future EAFs (Electric Arc Furnaces) of European steel companies.

By closely watching and following up these developments, OVET is prepared for the future and is ready to support its customers in every possible way to guide them in their developments and logistic challenges.

New landing in the Port of Amsterdam for Nova Marine with Bolten and Ership

Full control acquired of VCK Port Logistics and of the only terminal with "covered" berths capable of operating in all weather conditions.

Nova Marine Carriers, together with German shipping company Aug. Bolten and Spanish group Ership, has completed the acquisition of 100% of VCK Port Logistics and its port infrastructure in the Port of Amsterdam, through the Dutch subsidiary Maja Stuwadoorsgroep B.V.

The acquisition includes the Waterland Terminal, Europe's only terminal capable of 24/7 operations under cover, featuring the unique 'one roof all weather' concept and

dehumidified warehouses for steel and other breakbulk and dry bulk cargo.

With over 100 years of history, VCK is a highly respected logistics operator. Operational continuity for customers and employees is ensured, with the current management team retaining responsibility for day-to-day operations.

This transaction strengthens Nova Marine Carriers' strategy of vertical integration, expanding control across the entire supply chain and investing in technologically advanced and operationally efficient port infrastructure.

This follows the February 2025 acquisition of the Vlothaven bulk terminal in Amsterdam by the same Nova–Bolten–Ership partnership. Both terminals will now be integrated under Maja Stuwadoorsgroep B.V., consolidating the group's presence in the European port logistics sector.

Nova, through its subsidiary Nova Marine Carriers SA, headquartered in Lugano, Switzerland, and controlled by the Romeo and Gozzi families, owns and operates a diversified fleet of modern bulk carriers and belt self-unloading vessels with capacities ranging from 5,000dwt to 66,000dwt.

With around one hundred vessels under control, Nova specializes in bulk traffic in the Mediterranean, Atlantic and Middle East, as well as Italian/European cabotage. In the last five years, the group has also been active in port logistics through a series of strategic investments.

Aug. Bolten is a German shipping company with more than 200 years of history in dry bulk shipping. The company has a long-standing armatorial tradition and aims to further grow in dry bulk and in the newly acquired breakbulk activities together with its Swiss partner Nova Marine Carriers. The acquisition of VCK, together with Ership, fits perfectly into this ambition, following the acquisition of Maja in the same port at the beginning of 2025.

Ership is a Spanish family-owned company with a maritime tradition founded more than 140 years ago. The group specializes in port operations, shipowning and ship management, shipbroking, ship agency, freight forwarding and customs brokerage. Ership Grupo is active in more than 40 ports across Europe (mainly the Iberian Peninsula), America, Africa and Asia. DCi

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