

J M BAXI GROUP

# TIDINGS

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\* All maps are for representation purposes only



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## From the Quarter Deck

**D**ear Friends and Colleagues,

As we conclude FY 2022-23, and read India's 2023-24 annual budget, we can analyse the year gone by and approximations for the coming year. Inflation is at 8 percent, compared to the 3 percent we hoped for. GDP growth is at 6 percent, lower compared to the 7.5 percent that we aimed for. That said, India enters the new financial year relatively unscathed from the consequences of the Russia-Ukraine war and the recessionary trends led by UK, Europe and the US notwithstanding the collapse of Silicon Valley Bank. The world is seeing the tightening of monetary policies across most nations. It is after 15 to 20 years that we are seeing interest rates increasing and the cost of money rising. India's annual budget emphasizes on stability with creation and growth of infrastructure remaining overarching objectives. Ports, rails and roads continue to get investment and encouragement. Manufacturing and exports are pushed with positive policy intervention. This is happening with an emphasis on digitization and technology growth. The overarching direction has been focusing on value addition. The stress on the banking system has continued to ease with the number and magnitude of non-performing assets (NPAs) reducing, leading to a stronger and cleaner banking and credit system.

In terms of trade volumes, India has shown remarkable resilience, and although the numbers have not shown runaway growth, we have seen the numbers hold, and in some commodities and ports, they have grown.

At the end of the calendar year, major container shipping companies have declared never-before-seen profits. This is despite the last quarter of the year seeing a steep fall in freight rates, cargo volumes and therefore profits.

Container shipping carriers have entered 2023 with considerable strength and bulging order books for new ships. This will be necessary because today almost 23 percent of the world's container tonnage is over 20 years

old. The shipping industry in general and containers in particular are also grappling with being future fuel ready as also future right-size ready.

The deliveries this year of ships larger than 6,000 TEU size are more than 130.

From an Indian perspective, larger ships are being pressed into various Indian services, and additional services are opening up from India to various trade routes both westbound and eastbound.

The world of bulk shipping has been relatively smooth sailing, with both cargo volumes across commodities and geographic trade remaining stable. Gas carriers have also continued to do well due to enhanced gas movements from US to Europe, on the back of sanctions on Russia.

The J M Baxi Ports & Logistics business have been hard at work. Nhava Sheva Freeport Terminal, the joint venture between J M Baxi and CMA CGM achieved a milestone as it accepted its first ship, M V CMA CGM Melisande. This project will be fully commissioned well before the stipulated time. Our other terminals, Inchhapuri rail terminal and the Nhava Sheva Distribution Terminal are making good progress, and with the commissioning of an electric RTG, our Delhi Inland Container Terminal, achieved a throughput of 17,000 TEU in January 2023.

At the corporate level, Bain Capital have decided to exit their investments and sell their holdings to Hapag Lloyd, subject to requisite approval from the Government of India and when they exit we are sure that their expectations and aspirations will be exceeded. We will welcome with all honour and humility the entry of Hapag Lloyd and we hope to jointly grow together, feeding into each other's aspirations and strengths.

I am happy to share that Portall has won the mandate for implementation of the Port Community System for Mawani Ports in the Kingdom Saudi Arabia. J M Baxi Technologies are indeed beginning to convert their steps into strides.

One of the greatest challenges and opportunities that lie before us is the



transition into clean green energy. Over the next few years, the changes are going to be phenomenal and irreversible. As a company, we have to keep ourselves at the cutting edge of development. Across our various verticals, we are reworking and recalibrating all our processes and erecting a new paradigm. I continue to urge each of our J M Baxi colleagues to be a volunteer in this mission. The traction and interest we are receiving from our clients, customers, and principals for such initiatives have been phenomenal.

The second great opportunity before us is enhancing the skills of our colleagues. We all know that one of the greatest managerial challenges is 'PEOPLE' - the right people, the right person in the right place. JMB-Uni-E and VIPM are two of our entities that are transforming themselves into strong initiatives. The curriculum and this faculty are fast-growing, relevant and forward-looking. Across our group, we are planning internships, mentorships and upskilling programmes.

Last year India reached the 5th position with a GDP of US \$ 3.2 Tn. By the year 2030, India will become a US \$ 5 Tn economy, and the volumes of cargo to be handled in India should be at least 30 Mn TEU (presently 19 million TEU) and 5 Bn ton (present volume of 1.4 Bn ton). To be able to handle such an amount of business and growth, skilled people will be a must.

As we begin a fresh new start, I look forward to us at J M Baxi becoming leading change agents in pursuit of a brighter future.

**Krishna B. Kotak**  
Chairman - J M BAXI GROUP



## Marine Services

# Climate Change And Its Compounding Effect On The Shipping Industry



Barges, stranded by low water, sit at the Port of Rosedale along the Mississippi River on October 20, 2022, in Rosedale, Mississippi

**C**limate change is fast creeping up where its effects are becoming more real, and less of a vague unfathomable concept. For the shipping industry, the drying up of the Mississippi River is a case in point. The serious drought in much of the United States over the past several months has impacted the Mississippi River, the second-longest river in North America after the Missouri River. It flows 2,350 miles from its source at Lake Itasca through the centre of the continental United States to the Gulf of Mexico. Some describe the Mississippi River as being the third-longest river system in the world. Known as a water super highway, it has been said that one-twelfth of the world's population

eats something that emanates from the Mississippi River Basin and forty percent of global food supply starts at the Mississippi River Basin. Therefore it is a grave concern that water levels have fallen so low in some places, that they surpassed records set more than 30 years ago.

The Mississippi River is an important route for commerce. Thousands of barges haul essential commodities such as gas, coal, fertilizer and building materials along the 3,766-kilometer stretch of waterway. While barges are cheaper and more environmentally friendly to use than trucks or railways, the low water levels are making it difficult for boats to clear some parts of the river, and the U.S. Army Corps

of Engineers is dredging to maintain a channel for the barges, which are moving very slowly along the Mississippi. Agricultural exports like corn, wheat and soybeans are being moved downriver for export, and that's why these disruptions due to low water are so significant. With the war in Ukraine, global buyers are turning to the United States to purchase agricultural products, and European countries are purchasing coal for energy to fill the gap from Russia. More than a third of the rain in the United States ends up in the Mississippi River system. With little or no rainfall coming from the Midwest, the drought is causing problems along the river. Ships and barges are running aground, and navigation is slowed up and down the busy shipping corridor.



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Similarly in China, parts of the Yangtze River, whose surrounding provinces produce 45 percent of the country's economic output, were closed to ships because water levels were more than 50 percent below average. Meanwhile, two-thirds of Europe experienced drought conditions in 2022, as the continent saw its worst dry spell in at least 500 years. Last summer, the drying up of Europe's waterways disrupted an US \$ 80 Bn trade business, affecting oil refining, chemical production, power generation and corn farming.

The problem of rivers drying up is further compounded by ground water or wetlands becoming parched. Functioning as natural sponges, wetlands are supposed to be permanently saturated with water. Apart from providing water for drinking and irrigation it keeps water flowing into streams, rivers, lakes and reservoirs. During periods of low water levels in lakes and rivers, the slow discharge of groundwater to surface waters often helps maintain minimum water levels by releasing stored water directly into these systems.

At one time, there were extensive wetlands around New Orleans and other coastal communities that provided a natural resilience to storms. In total, about 50 miles (80 kilometres) of marshland once protected New Orleans from the Gulf, with trees and marsh grasses that blocked the winds and blunted storm surges. Today coastal Louisiana is losing 24 square miles of wetlands each year—roughly equivalent to a football field every 100 minutes. Since the 1930s, Louisiana has lost an area of coastal land equal to the size of the state of Delaware. If this rate of wetland loss is not slowed, by the year 2040 the coastal shoreline will advance inland as much as 33 miles (53 kilometres) in some areas.

Wetland loss occurs because of natural causes—subsidence and wave

## Could some of the other well-known navigable waterways have the same fate?

### Panama Canal

*Length 82 km: Width 150 m:  
Depth: 12 m*

In 1934 it was estimated that the maximum traffic of the canal would be around 80 Mn ton of shipping a year, but by 2015, canal traffic exceeded 340 Mn ton of shipping – over 4 times the original estimate. Today, nearly 15,000 ships pass through the Isthmus of Panama via the Canal annually.

### Suez Canal

*Length 193 km: Width 205 m:  
Depth: 20 m*

The canal offers vessels a direct route between the North Atlantic and northern Indian oceans via the Mediterranean Sea and the Red Sea, avoiding the South Atlantic and southern Indian oceans. This reduces the distance from the Arabian Sea

to London by approximately 8,900 kilometres (5,500 mi), or 10 days at 20 knots (37 km/h; 23 mph).

### Kiel Canal

*Length 98 km: Width 100 m:  
Depth: 11 m*

The Kiel Canal is the world's most frequented artificial waterway with an annual average of 32,000 ships (90 daily), transporting approximately 100 Mn ton of goods.

### Houston Ship Channel

*Length 80 km: Width 160 m:  
Depth: 11 m*

The 52-mile Houston Ship Channel is one of America's most important waterways, serving to connect the nation's largest petrochemical complex with global markets. It accounts for over 16 percent of the total GDP for the state of Texas.

erosion; as well as human causes - construction of river levees, channels, canals, lands reclaimed for agricultural purposes or urban development. The natural balance of the wetlands in the Mississippi River Delta too have been disrupted. Prior to human development, natural wetland loss was replenished by Mississippi River sediments and nutrients creating new wetlands. Human activities have the unfortunate side effect of causing the Mississippi River sediments to go straight down the river's channel and into the Gulf of Mexico. Not only are wetlands being destroyed, but the natural cycle that rebuilds them is also being disrupted.

In the aftermath of Hurricane Katrina, one of the lessons learned is that a healthy system of wetlands between

New Orleans and the Gulf almost certainly would have slowed down the storm and dampened the storm surge. Without natural storm buffers, breaches in levees such as those after Hurricane Katrina could become an even bigger threat. Wetlands serve as nature's first line of defence by absorbing much of the damage caused by hurricanes.

These incidents bring home the fact that this is not just a sign of the times to come but is the world's collective reality. We cannot take for granted that rivers are perennial, and if we aren't conscious, we may go too far down the path of self-destruction, to be able to press the rewind button and undo what is coming undone now.

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## Making Maritime Sustainable

**E**very drop in the ocean counts – literally and figuratively when it comes to environment friendly initiatives. Every industry is making conscious efforts to move towards sustainable practices egged on by governments and guided by international confederations and experts that help usher such practices. While the shipping industry is an essential proponent that keeps the wheel of the economy churning, it also causes a significant portion of greenhouse gas emissions. A 2021 industry study highlights that the global shipping industry accounts for around 4 percent of CO<sub>2</sub> emissions, an estimated 15 percent of global Nitrous Oxides (NO<sub>x</sub>) emissions, and 4-6 percent of global Sulphur Oxide (SO<sub>x</sub>) emissions. Here are some of the initiatives that the shipping industry is pressing ahead for adoption, in a bid to create a sustainable future.

### The use of plastics

The problem of plastics in the ocean is global and growing. On 16th October 2019, the Indian Directorate General of Shipping prohibited the use of single-use plastic items on board ships. The rule applies to both Indian and foreign-flag ships and prohibits the use of items made from plastic like cutlery, plates, cups, bottles up to 10 litres of liquids, bags, trays, containers etc. whilst in Indian territorial waters. According to the rules, the ships must keep all their single-use plastic items locked in a store during their stay at Indian ports, during their passage through the territorial waters of India and are prohibited from discharging these items at port reception facilities. To ensure this compliance, the International Maritime Organization (IMO) recommends that “all ship



owners and operators should minimize taking on board material that could become garbage”. In order to document compliance during port state control, foreign-flagged ships intending to enter Indian ports are required to make a log entry identifying single-use plastic items available on board the ship, where the items are stored while the ship operates in Indian waters, and when (time, latitude and longitude) the items were placed in the store prior to entering Indian territorial waters. Under The International Convention for the Prevention of Pollution from Ships (MARPOL) Annex V, all plastic waste generated during the normal operation of the ship is strictly banned from discharge in any waters. Guidelines adopted by IMO recommend that, ship owners and operators, where possible with the ship’s suppliers, should consider the products being procured in terms of the garbage they will generate. Ships must avoid using supplies that come in bulk packaging, taking into account factors such as adequate shelf-life to avoid increasing garbage associated with such products, using supplies that come in reusable or recyclable packaging and containers,

avoiding the use of disposable convenience items whenever possible and avoiding supplies that are packaged in plastic.

The biggest challenge India faces in terms of the plastic ban is the lack of cheaper alternatives. The waste management system in India is also in need of major improvements to actually enforce this ban and curb the pollution caused by single-use plastics. Strong marketing of cheaper alternatives to single-use plastic, spreading environmental awareness amongst the population and a better waste management system need to be planned to effectively and successfully implement the ban on the use of single-use plastic.

### Sewage disposal

Risks of harm arising from improperly managed ship wastes are increasing with the greater number of ships in service, and increasing habitation in port areas. That being said, various restrictions have been imposed on depositing hazardous wastes into water bodies. This means that ships



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need to capture and retain harmful wastes on board for periods of time. Waste needs to be appropriately disposed of, in accordance with the rules and regulations applicable at the point of disposal. All ships should be equipped with facilities for safe treatment, storage and discharge of medical waste in the sewage system. The 1978 protocol and amendments collated into a consolidated version in 2002, recommends that staff at ports and ship crews involved in the collection, handling and disposal of wastes need to be trained in the relevant legislation and the risks posed by waste. Effective enforcement is key to ensuring compliance. In some cases, waste-management treatment systems have failed to perform as required, resulting in unsafe situations. Therefore, reliance should not be placed on treatment and management systems alone. Multiple waste-management barriers should be actively maintained, considering how waste is generated on board, and choosing activities and practices that produce the least hazardous waste in the first place; matching waste-management treatment facilities to their required capacities and maintaining sound practices in collecting and storing waste. IMO provides various guidelines to ensure that the waste generated on ships is managed safely. That however,

is translated rather loosely on-ground. At present, ship owners and yards have vessels carrying non-conformities and poor sewage treatment plant performance. For industry stakeholders this is more about a tick-in-the-box activity, as opposed to a genuine effort with a focus on outcomes. This lackadaisical approach stems from the various compliance norms that are impractical. Eventually what we are left with is loop-holed guidelines, a poorly functioning system and a major compromise on quality. Improving the sewage guidelines can be a very positive and significant step but, it

may be important to introduce process monitoring requirements, including online monitoring for sewage treatment plants, effluent turbidity and flow rates. This will provide good visibility for the marine industry to get a handle on sewage pollution control. Such visibilities could pave the way for a future regulatory framework, capable of closing the gap between the rules and the realities that will be evidence based, practicable and sustainable.

## Ballast Water Treatment Systems (BWTS)

Since the introduction of steel-hulled vessels, water has been used as ballast to stabilize vessels at sea. While ballast water is essential for safe and efficient modern shipping operations, it may pose serious ecological, economic and health problems due to the multitude of marine species it carries. As the volumes of seaborne trade continue to increase, this has become an international problem. IMO has been at the front of international efforts, taking the lead in addressing the transfer of Invasive Aquatic Species (IAS) through shipping. The type of ballast water treatment system a ship needs varies based on size, available space, budget etc. The various types



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of treatments for ballast water include chemical disinfection, U.V. treatment, deoxygenation, heat treatment and ultrasonic treatment. Chemical disinfection uses biocides (chlorine) to inactivate microorganisms in the ballast water. Ultraviolet lamps used for BWTS impact the DNA of the organisms and render them non-viable for reproduction. This effectively eliminates the microorganisms from thriving in the water and prevents them from burdening the ecosystem where the water is released. Deoxygenation includes inserting an inert gas like nitrogen into the ballast flow to kill the microorganisms. This treatment is recommended for long transits. Other treatments involve heat, which requires ballast water to be heated in tanks run through the engines to kill any microorganism. Ultrasonic treatment uses high energy ultrasound to eliminate organisms in the ballast water which kills the microorganisms by breaking down their cells. It is low maintenance and non-chemical, making it an attractive choice for ships. Preventing the transfer of invasive species and coordinating a timely and effective response to invasions requires cooperation and collaboration among governments, economic sectors, non-governmental organisations and international treaty organisations.

## Moving towards cleaner fuels

The International Maritime Organization (IMO) has limited marine fuel sulphur content, in both Sulphur Emission Control Areas (SECAs) and Nitrogen Oxide Emission Control Areas (NECAs) to 0.5 percent globally by 2020. To mitigate emissions from ships, the IMO has issued and implemented more stringent regulations related to marine sulphur content and NOx emissions. Liquefied natural gas (LNG) tops the list of nontraditional fuels currently used in commercial ships, including some large container vessels. Switching from Heavy Fuel Oil (HFO) to LNG could reduce SOx emissions by 99 percent, NOx emissions by 80 percent,

and CO2 emissions by as much as 20 percent. LNG also produces relatively little particulate matter. Switching to methanol made from many types of solid and liquid biomass feedstock could lower emissions from shipping and reduce the industry's overall environmental impact as methanol is a liquid that is stored, transported, and used at ambient temperature. Hydrogen, which is a clean fuel, is also a recommendation. It is found that grey liquid hydrogen is reasonably cost-effective, and it produces almost no carbon emissions when combusted to propel the ship. The carbon footprint of green liquid H2 can be as low as 4.6 and 11.7 g CO2 eq/MJ for hydrogen made with wind and solar energy, respectively, making it a promising shipping fuel. The use of scrubbers is a commercially available option for the shipping industry as ships installed with scrubbers can continue to burn high-sulphur bunker fuel and still comply with the 0.5 percent sulphur limit. This technology works by spraying alkaline water into a vessel's exhaust to remove sulphur and other unwanted chemicals. There are three types of scrubbers- open loop, closed loop and hybrid. scrubbers can eliminate 97-98 percent of (SOx) and 70-80 percent of particulate matter (PM). The Exhaust Gas Cleaning Systems (EGCS) open loop scrubbing is preferred as it is the simplest scrubbing system and demanded by ship crew. Although many early adopters in the North Sea and Baltic, fitted hybrid systems, they are operated for mostly in open loop. Closed loop and hybrid systems are available for enclosed bodies of water with little water exchange or where discharge is restricted by local regulation.

## Emission trading systems

Around the world, people and governments are making efforts to combat pollution. The Kyoto Protocol, a United Nations agreement to limit the emission of greenhouse gases, has been signed by 191 countries.

China, the US, and India have made great improvements in shifting to alternative energy sources in light of their net-zero targets. The final COP27 agreement includes the long-awaited provision to establish a fund to help developing countries that are particularly vulnerable to global warming. The European Parliament and Council have reached an agreement that effectively bans all sale of fossil fuel cars and vans by 2035 making the EU, the world's first region to go all-electric. They added the shipping industry to the bloc's Emission Trading System (ETS) that effectively forces vessels to pay for their carbon dioxide, methane and nitrogen dioxide emissions for voyages within the bloc and that adds pressure to scale up green infrastructure and technologies. For securing a global action plan to halt and reverse biodiversity loss by the end of the decade, countries have allocated US \$ 200 Bn per year for biodiversity initiatives both from the private and public sectors.

## Our responsibility as ship agents

Over the last 8 years the Government of India has focused on port-led development which includes expanding port capacities and making the existing systems even more efficient along with ensuring that the marine eco-system and biodiversity is safe-guarded. Waterways are being harnessed to ensure Indian products get access to new markets. Therefore, as the runway for growth of the maritime industry expands, so does the responsibility that each of us takes in preserving our environment. To that effect, ship agents play an integral role in not only adhering to the rules and regulations, but also making sure ship masters and owners are aware of and follow through on the various compliances, means of disposal and prevention of further tainting of the environment. The onus is on us to ensure we do right by our customers, our country and mother nature - all of which have given us immensely.



## In Conversation

# With Dr. ANIL SHARMA, Founder And CEO Of The Leading Cash Buyer Of Ships, GMS

**Tell us about your incredible journey from academia to maritime.**

Usually, when you start a business, you have a particular idea of what you want to do. But when you start at zero, you take one step at a time and don't imagine you will be an industry leader one day. The journey is very organic.

I was born and brought up in Bhavnagar, India. After my bachelor's degree in Ahmedabad, I went to the USA for my Masters and, subsequently, a Doctorate in Business. Post graduation, I taught full-time at a university near Washington DC, for nine years. I was a professor in business management and enjoyed my life in academia.

I didn't know about the maritime business, shipping or ship recycling. However, I knew several recyclers back in Alang because my family lived in Bhavnagar and still do. Most of these recyclers were moving to Bhavnagar from Mumbai and other cities to participate in the formative years of ship recycling in India. As luck would have it, my father owned a transportation business (trucking company) in Bhavnagar that brought household furniture and other personal items to customer's new homes in Bhavnagar.

At the same time, the US Maritime Administration - Department of Transportation (MARAD) was looking to sell obsolete naval vessels from its reserve fleets based in the USA. These were high-value vessels due to their high non-ferrous content. I often got calls from my brother and his friends asking me to try and buy these vessels on their behalf. This was way back in the early 90s. I saw this as an opportunity worth trying.

My academic background helped with reading and understanding the long,



*Dr. Anil Sharma is the Founder and CEO of Global Marketing Systems (GMS)—the world's largest buyer of ships and offshore assets for recycling. A first-generation businessman, Dr. Sharma was an academician for a decade, prior to founding GMS. He has been credited with formulating the term 'ship recycling' (previously known as ship breaking or demolition), and has set high standards for the maritime sector with regards to ethical and fair business practices. Dr. Sharma holds a Masters and a Doctorate in Business Administration.*

*GMS is headquartered in Dubai and has an in-house team of experts dealing with the recycling of aged vessels by providing end-to-end ESG-friendly solutions to ship owners with vintage assets.*

complicated legal contracts of MARAD. I successfully closed my very first ship deal in January 1992. Since GMS was not born yet, I bid under my name for this ship, despite the seemingly daunting size, scope and liabilities. Fortunately, I was able to deliver the ship successfully to Alang.

Armed with this knowledge and confidence, I started participating in all MARAD tenders and bought six out of the eight ships MARAD sold

that year. I think what helped me was that we displayed a high degree of professionalism.

In 1993, out of the blue, I got a call from the Russian Consulate in Washington DC saying they got my reference from MARAD and invited me to buy obsolete naval vessels for demolition from the Russian fleet. By then, I had formed GMS, and with the help of the Russian Consulate, I flew into Russia – whose economy was just opening up. Those initial years were extremely challenging, dangerous and exciting.

For the next few years, I simultaneously continued teaching while buying naval vessels from the USA and Russia. Who would have thought that an Indian played a small role in clearing the mothballed American and Russian Naval Fleet?

We would buy ships, prepare them for towage and then tow them across the Atlantic or Pacific Oceans. We did this all without any expertise in shipping. In 1996, I finally resigned from my teaching career to fully concentrate on the commercial aspects of the shipping business. I moved out of the basement of my home office to the most prominent office building in Cumberland (where I lived). The rest, as they say, is history. It's been an incredible journey - 30 years and still going strong.

**Can you describe the typical process/business flow of the sector? Do you buy a ship as is and then use it for a final cargo voyage or two - or directly proceed to demolition?**

Once purchased, next steps depend on the contract we have with the sellers. In some cases, sellers will deliver the vessel to the ship recycling yards, but in many cases, they will give it to us as is, at the last port of discharge. If the

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vessels are still operating well, have up-to-date certification, and the contract with sellers allows buyers to trade the vessel, the vessel may make a final voyage before going to the recycling yard (this applies mainly to bulkers).

In some cases, sellers prefer to sell vintage assets for trading. These assets are generally purchased for our ship-owning arm, Lila Global. In such cases, we approach the seller and are transparent about our desire to operate the vessel in our fleet. We truly believe that as long as vessels continue to burn fossil fuels, extending the life of a perfectly good vessel creates lower carbon emissions than building new ships. However, in some cases, the seller does not wish for the vessel to be operated further, but to go directly to the shipyard for recycling (to reduce capacity). In such cases, we do exactly as the owner wishes.

While GMS began with solely ship recycling, ship operating and cargo handling is a relatively new segment that began in 2006. We are fortunate to play a role in the three 'R's- Reduce, Reuse, Recycle enabling us to do our part in reducing carbon footprint.

**What are the factors that determine the success of GMS and its foremost position in the ship recycling space for this long?**

Our business practice is aimed at not just delivering value for our clients but also staying true to our values, which determine our long-term reputation. For me, the focus is on understanding the client's needs and ensuring we go the extra mile to deliver above and beyond those needs.

A particular aspect that GMS brings to the table is to simplify the recycling process and making it easy for owners to sell their ships, hassle-free. We look at the big picture and collaborate with various stakeholders in the industry. We work with industry organizations like IMO, BIMCO, etc., to structure ship

recycling contracts, which have now become standard contracts used by the maritime industry across the globe.

We also created the Vessel Detail Form (VDF), a one-page questionnaire that an owner can complete in less than an hour. Once we have this questionnaire, we can promptly revert with a firm offer to the sellers. In fact, one of the most expensive recycling deals in history was completed in a few hours on a Friday evening! The VDF has become the standard industry questionnaire we all see today. None of these documents were designed to be proprietary because it's implementation is good for the sector as a whole. We genuinely believe in the communal spirit of the maritime industry and work hard not just to be a part of its future but to be a guiding light for its best practices.

**With an aging global shipping fleet on one side, a turbulent economy on the other side, and tighter ESG norms coming in on the 3rd side, how do you see the next couple of years for the demolition industry?**

The most significant factor affecting ship recycling is freight rates, which are much more critical than the fleet's age. Various external forces can impact freight rates, including recession, interest rates, lack of capital, oversupply of vessels and so forth. From 2003 to 2007, we had a favorable economic market followed by a recession and a short market resurgence. However, in 2022, there was a distinct shortage of vessels, making it one of the slowest years of recycling in 15 years, with just 11.5 Mn ton of deadweight for recycling. At the peak of 2012, almost 57 Mn ton of dead weight was recycled!!

While 2022 was not as bad as the global meltdown of 2007 (with just 5.5 Mn ton of deadweight for recycling), last year was challenging in this market. But 2023 is destined to be a busy year for ship recycling. Container ships are likely to lead the supply of vessels, followed by dry bulk. We expect the recycling volumes to triple (about 30

Mn ton) in 2023 compared to 2022. We believe that this tonnage will be phased out of circulation in part due to regulations, the changing attitudes towards fuel efficiency but primarily due to falling freight rates, recessionary global outlook, and overcapacity in this sector. We also believe that the Carbon Intensity Indicator (CII), the Energy Efficiency Existing Ship Index (EEXI), and other such regulations will have a much more significant impact on the container fleet than other sectors.

**Is UP-CYCLING an area you will look into rather than just demolition - making old vessels seaworthy (hull or propeller upgrade etc) and delaying their visit to Alang? Or is that counterproductive from GMS' business model perspective?**

As I mentioned earlier, GMS truly believes in embodying the principles of big-picture thinking and sustainable best practices. My team and I have discussed this point at great length, and we think it is better to increase the life of a ship than prematurely recycle it since building more ships creates a bigger carbon footprint. It is worth remembering that the new vessels being built to replace these ships will also run on the same fossil fuels that the existing ships burn. Therefore, fuel efficiencies created by the new generation 'eco' ships far outweigh the carbon emissions generated to build ships (our research team estimates the increase to be as high as 2 to 3 times more). A few decades ago, a ship was considered a scrap candidate at 30 years. Today, regrettably, the life expectancy is 20 years! Ironically, the US still runs some of the oldest ships in its cabotage trade. In fact, we have seen 50-year-old vessels still trading in US waters. Therefore, extending the life of vintage assets—as long as the unit is well maintained and is International Association of Classification Societies (IACS) approved—is an ideal solution.

We believe there are ways to retrofit vessels with modern technologies, harness the power of data analysis to optimise operations, and use skilled



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crew to keep the vessel first-rate. We have research demonstrating the ESG value of lengthening the vessel's lifecycle and avoiding shorter recycling cycles. This kind of thinking led us to form our ship-owning arm Lila Global, which currently is focused on accruing quality vintage and mid-aged ships.

While all vessels will need to be recycled at the end of their lives, if it is still safe to operate the vessel, recycling is the best way to reduce shipping's impact on the environment and fight climate change, invest in non-fossil fuel technologies, and extend the life cycle of a vessel.

**What is your take on digitisation in the maritime industry, within your sphere? Could you also put some light in the recent initiatives from your end ?**

I am a firm believer in technology. We as an industry are lagging behind other sectors. However we are seeing a movement towards embracing technology. When I was in Japan before the COVID-19 pandemic, an industry expert said that 30 years ago, Japan's shipbuilding industry suffered from the three 'D's - Dirty, Dangerous and Depressing. Since then, the industry has made sweeping improvements and leapfrogged into the 21st century, emerging as the leading shipbuilding

nation in the world known for quality ships. However, unlike the automobile industry the technological changes in a modern ship compared to a ten-year-old ship are incremental (not transformational). Compare this to the latest model of a BMW with a ten-year-old model! It's time for the maritime industry to incorporate artificial intelligence, robotics, machine learning, remote operations, etc., to bring this vital industry to a place where we are ready for tomorrow. Technology can improve our chartering, operations, and accounting in addition to making the physical environment of a ship more efficient and crew friendly.

Our GMS team recently debuted the world's first ship-recycling app and successfully closed our first ship-recycling deal on it. I am excited to see how we can integrate digital platforms and apps like this to help various stakeholders interact seamlessly rather than deal with many un-connected siloed systems. We are aiming to digitalize the entire ship recycling commercial operations.

**Is the maritime industry going to be attractive to young people in the future? How do we make that happen?**

I believe that maritime holds the potential to attract the best and

brightest minds of the younger generation. But, we must make this a more inclusive industry to work in. Diversity needs to be prioritized because the more unique perspectives we can bring to the table, the more innovative our solutions can become. I am a strong proponent of women working in the maritime space. We have already seen examples of phenomenal growth in shipping companies led by women CEOs and Founders. As recently as a decade ago, there were few such examples. This generation of young women CEOs has already broken stereotypes of the male-dominated shipping fraternity and is a role model for a new generation of young adults.

In today's tech-heavy world, we need young talent to help us all lead the technological revolution in the maritime industry.

Even though a career in ship recycling may not be considered highly appealing, we are very proud that most of our workforce comprises young adults, some of whom have graduated from some of the leading maritime institutions of the world! I hope we can see even greater diversity in the future, including neurodiversity. With the right environment of acceptance, I foresee many members of the younger generation looking at maritime as a career.



## Technologies

# Technology Bridging The Gap Between Business And ESG

**D**igital transformation and sustainability today are mainstream in the modern economy. And as the spotlight on both intensify, it is becoming evident that the adoption of technologies is helping not just increase efficiencies but also helping achieve sustainability goals.

The use of technology in business processes can address environmental, social and governance issues. As awareness increases and legislation changes, companies are being forced to take measures to reduce their ecological footprint through moderate consumption of natural resources.

According to industry estimates, digital technologies can contribute to reducing global CO2 emissions by around 15 percent. Cloud computing can help reduce emissions by providing a virtual environment for applications, platforms, and software. According to data from International Data Corporation (IDC), the adoption of cloud computing could help to avoid the emission of more than one Bn tons of CO2 between 2021 and 2024.

One of the central benefits of going digital is the ability to abandon or reduce paper usage. The paper industry has a significant environmental impact, both in terms of the resources used to produce paper and the waste generated by paper consumption. According to Greenpeace, nearly half of all wood harvested for industrial uses is used to produce paper. Much of this paper is used for issuing invoices. The Billentis report entitled The E-Invoicing



Journey 2019-2025, estimates that the global market produces 550 Bn invoices per year. This figure is expected to increase fourfold by 2035. According to a 2019 study, only around 10 percent of all invoices were exchanged electronically, totalling around 55 Bn.

E-invoicing also helps eliminate mail transportation, thereby lowering CO2 emissions, and reducing fossil fuel pollution. The other cases for digitalization are automation lends security to transactions and increases transparency, in turn securing the trust of all stakeholders involved and the community at large. In addition, documents are stored for perpetuity, reducing the chances of loss or damage, all of which are crucial to business continuity. Business benefits that can immediately be accounted for are cost savings, ease of updation and scalability.

Digital transformation is often driven by larger purposes. COVID-19 was an example of how digital workplace

solutions, the cloud, high-speed networks and smart devices, kept us connected despite the physical distances. And more essentially, it aided in ensuring countries received vital goods.

The growth in international trade is the result of both technological developments and concerted efforts to reduce trade barriers. Compared to 40 years ago, the developing world is much more open to international trade and integrated in the global trading system. Global trade is projected to grow broadly in line with global GDP over the next 30 years. By 2050, it is expected to double in real terms and almost quadruple in dollar terms to reach close to USD \$ 100 Tn. Therefore, there is a need to break away from the siloed manner in which trade is conducted and have all stakeholders interact on a single platform.

To ensure sustainable development, the NLP-M or National Logistics



# Technologies

Platform – Marine, aims to bring all stakeholders in EXIM trade to transact on a singular platform. Governing bodies also appreciate that the system offers a single, integrated platform allowing for increased efficiency with continuous monitoring and administration. Increased value is also attached to such a facility, given the new security environment, with an emphasis on advance information and risk analysis. The United Nations Economic Commission for Europe (UNECE) defines such a single window system as a facility that allows parties involved in trade and transport to lodge standardized information and documents with a single-entry point to fulfil all import, export and transit-related regulatory requirements.

A large portion of the trade processing operation now takes place online, as the NLP-M system is interfaced with intermediary parties like banks. This reduces the time taken to secure permission and approvals. The system

helps bring in a lot of efficiency by allowing, pre-planning, scheduling and following through on commitments. Also, the GPS tracking system, live ETA functions and vehicle tracking can further improve real-time navigation and rerouting to save time and fuel costs by planning and navigating through the most efficient route. Good planning and management of container terminal operations can reduce vessel waiting time and fuel consumption. NLP-M, provides 24x7 support, allowing stakeholders to interact and resolve their issues immediately. The system with its two-way authentication, helps stakeholders safeguard their information. The data is stored at centres by cloud service providers, render ease of information retrieval and minimise loss.

The NLP-M is a government-authorized licenced platform, and permits approvals, submission of documents to customs services, port and transport activities, and transit

movement control activities. The single window predominantly focuses on document filing and submission services. The system is integrated with various government authorities like 'ICEGATE', 'CRIS-FOIS', 'DG Shipping', and many more. It also follows the International Organization for Standardization, i.e., ISO 9001:2015 for Quality Management Systems (QMS), ISO 27001:2013 for Information Security Management Systems (ISMS), and ISO 20000-1:2011 for Information Technology Service Management (ITSM) providing a strong basis for the development of national and international regulation.

Moving forward the need for the world to be faster and collaborate more closely, will be dire. Entities can ill afford to be working in isolation. As business picks up pace and trade blocs promote cross border business, countries must adopt technologies to help weave the various pieces of trade and logistics, to offer seamlessness of integration and transactions.



# Ports & Logistics

## Ethanol Blending In INDIA And The Transition Towards Green Energy

**India's rising energy concerns**

India is the world's third largest energy-consuming nation, and a significant part of its energy requirements are met through oil secured largely through imports. India's share in global energy consumption is set to double by 2050. Rising energy demand and high reliance on imports pose significant energy security challenges. It also leads to massive foreign currency outflow. Further, excessive use of fossil fuels leads to higher carbon emissions.

Domestically produced ethanol is a potential opportunity to reduce reliance on oil imports by blending it with conventional fossil fuels for consumption.

### What is ethanol?

Ethanol is one of the principal biofuels, which is naturally produced through the fermentation of sugars by yeasts or via petrochemical processes such as ethylene hydration. Apart from being an alternative fuel source, it is used as a chemical solvent and has medical applications as an antiseptic and disinfectant.

Currently, most of this ethanol is made from molasses, a by-product of sugarcane. The production process uses a lot of water. Every litre of ethanol needs 2,860 litres of water.

### Ethanol blending

India started blending ethanol in petrol, on a pilot basis in 2001. However, the Ethanol Blending Programme (EBP) was formally launched in January 2003. In 2006, the Ministry of Petroleum and Natural

Gas, directed the Public Sector Oil Marketing Companies (OMCs) to sell 5 percent EBP in 20 states and 4 union territories. Even though the programme started early, it faced multiple inherent challenges leading to slow adoption and growth.

### Various challenges leading to unsatisfactory performance of EBP

- Non-inclusion of grain conversion to ethanol, restricting grain-based distilleries to participate in EBP.
- High taxation rate of ethanol at 18 percent
- Procurement challenges due to infrastructure and multiple tenders in a given supply year.
- Dissatisfactory 'take home' price and irregular pricing for ethanol suppliers.
- Limited availability of feedstock

### To overcome challenges, the government introduced the following key stimulus packages to the EBP:

2014 - 2015	<ul style="list-style-type: none"><li>• Re-introduced administered price mechanism for ethanol to be procured under the EBP.</li><li>• Directed oil PSEs to set up bio-refineries.</li><li>• Tendering process simplified</li></ul>
2016	<ul style="list-style-type: none"><li>• IDR act amendment to clarify the roles of Central/ State Govt. for continuous supply of ethanol for blending with petrol</li></ul>
2018 - 2019	<ul style="list-style-type: none"><li>• Extending financial assistance in the form of interest subvention at 6 percent per annum or 50 percent of the</li></ul>

	<p>rate of interest charged by banks/financial institutions whichever is lower for five years including a one-year moratorium.</p> <ul style="list-style-type: none"><li>• GST on ethanol lowered from 18 percent to 5 percent.</li><li>• Alternate source for production of Ethanol - Allowed conversion of heavy molasses, sugarcane, juice and damaged food grains to ethanol.</li><li>• Extension of EBP to the whole country except Andaman Nicobar and Lakshadweep</li><li>• One- time registration of ethanol suppliers for long term, including giving them visibility of ethanol demand for 5 years.</li><li>• Additional differential excise duty of rupees two per litre on unblended fuel from October 2022</li><li>• Notification for target of blending 20 percent of ethanol in petrol by April 2025</li></ul>
2020	

### Effects of reforms

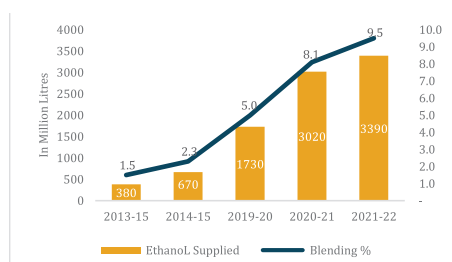
India has achieved the target of 10 percent ethanol blending five months ahead of the November 2022 target which translates into:

- Reduced import bill and increasing self-reliance - cumulative foreign exchange impact due to EBP is over US \$ 3,206 Mn during the period of 2014 to 2021

# Ports & Logistics

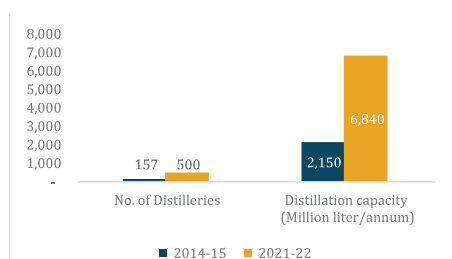
- Green House Gas emissions reduction of 2.7 Mn ton (10 Mn litre of ethanol blended petrol can save around 20,000 ton of CO<sub>2</sub>)
- Protecting the economic interest of farmers – OMCs have paid sugar mills nearly US \$ 5,079 Mn for ethanol supplies in the last seven years, which has helped mills clear farmers' dues. Additionally, decisions have been taken to buy damaged and surplus food grains for ethanol production.

**Ethanol supplies and blending percentage have increased more than 9 times since, 2013-14.**



India plans to achieve 12 percent ethanol blending in 2022-23 and meet the target of 25 percent by 2025.

**Ethanol distillation has increased by 200 since 2014-15.**



## Effects on the sugar industry

To meet the anticipated ethanol demand, the rush is to bolster the sugar industry as sugar ethanol is the most viable and a cheaper source of ethanol fuel.

Most of India's ethanol is produced from sugarcane, with molasses-based distilleries making up 4,260 Mn Liters of the overall production capacity.

India's sugar production has reached 40 Mn ton against the consumption of 27 Mn ton, so 13 Mn ton of excess sugar can be diverted for production of ethanol as against 4.5 Mn ton being done currently. This excess production is being exported now. Indian exports are likely to touch 11 Mn ton this year.

This has made India the second-largest exporter of sugar in the world after Brazil, but exports are not a long-term solution. Indian sugar can sometimes command higher prices compared to other sugar producers, due to higher sugarcane prices. The situation gets exacerbated when there is global surplus production. This can oftentimes lead to Indian stock lying idle, with payments to sugarcane growers held up.

Simply put, the sugarcane industry is the backbone of India's sustainable and renewable fuels push. It is indispensable to India's ambition of slashing its current account deficit, attaining energy security and meeting its 2070 net-zero carbon emissions target.

The sugar industry is bound to gain from the increasing thrust of the ethanol program as it powers the country's self-reliance and carbon-free dreams.

## India geared for green energy transition and climate action.

India has time and again shown its commitment to environmental stewardship, climate action and focus on renewables to decarbonize the way the country operates.

### India's 2030 commitments are:

- Increasing non-fossil energy capacity to 500 Gigawatts (GWs)
- Fulfilling 50 percent of energy requirements from renewable sources
- Reducing carbon intensity of the economy by 45 percent and reducing the total projected carbon emissions by 1 Bn ton.
- The provisions relating to climate in the Union Budget 2022-23 reflect India's commitment to achieve the target of net-zero carbon emissions.
- The Ministry of Environment, Forests and Climate change received a total allocation of US \$ 366 Mn (increase in allocation of budget in comparison to US \$ 318 Mn in FY2013-14). US \$ 56 Mn has been allotted towards control of pollution which is a sizeable amount.
- FAME-India (Faster Adoption and Manufacturing of Hybrid

## Future opportunities for the ethanol industry

The ethanol industry is expected to grow by 500 percent

- By 2025, at 20 percent blending level, ethanol demand will increase to 10,160 Mn litres. Therefore, the worth of the ethanol industry will jump by over 500 percent from around US \$ 1088 Mn to over US \$ 6047 Mn.

Ethanol distillation capacity to grow around 2 times to 15,000 million litre annually

- 895 proposals with loan amounts of US \$ 8516 Mn
- 16.5 Mn ton of surplus grain to be utilized annually from 2025 to produce ethanol which would result in US \$ 3268 Mn payment to farmers.

Integrated bio refinery: Second generation (2G) ethanol plant

- These plants can convert agricultural residues like rice straw, wheat straw, energy crops etc. to ethanol. With around 160 Mn ton of surplus agricultural residues generated in India annually, 2G ethanol plants offer significant opportunity.



# Ports & Logistics






- and Electric Vehicle in India), the scheme received a big boost from US \$ 97 Mn last year to US \$ 352 Mn this year. The government had approved Phase-II of the FAME scheme with an outlay of US \$ 1209 Mn for a period of five years. This phase aims to generate demand by way of supporting 7,090 e-buses, 0.5 Mn e-three wheelers, 55,000 e-Four-wheeler passenger cars (including strong hybrid) and 1 Mn e-two wheelers. The permit requirement for electric vehicles has also been removed.
- GST on electric vehicles has also been reduced from 12 percent to 5 percent; GST on chargers/ charging stations for electric vehicles has also been reduced from 18 percent to 5 percent.
  - Ministry of New and Renewable Energy (MNRE) being responsible for overseeing India's ambitious renewable energy targets - To achieve the target of producing 280 GW of installed solar capacity by 2030, the solar energy sector including both grid-interactive and off-grid projects received the highest allocation in the MNRE. It has been allocated US \$ 407 Mn compared to last year's US \$ 315 Mn, a 29 percent increase.
  - In a push for Electric Vehicle (EV) adoption, a battery swapping policy along with inter-operability standards to improve efficiency in the EV ecosystem was announced. This will allow drivers to replace depleted battery blocks for freshly charged ones at swap stations, a faster option than charging stations. It also incentivizes the private sector to develop sustainable and innovative business models for battery or energy as a service.
  - Alternate green fuels - On August 15, 2021, the National Hydrogen Mission was launched. The Mission aims to aid the government in meeting its climate targets and making India a green hydrogen hub. This will help in meeting the target production of 5 Mn ton of green hydrogen by 2030 and the related development of renewable energy capacity. Hydrogen and ammonia are envisaged to be the future fuels to replace fossil fuels.
  - Green Port Policy: A framework for implementation/interventions

carried out towards becoming sustainable and to reduce, mitigate and manage environmental pollution.

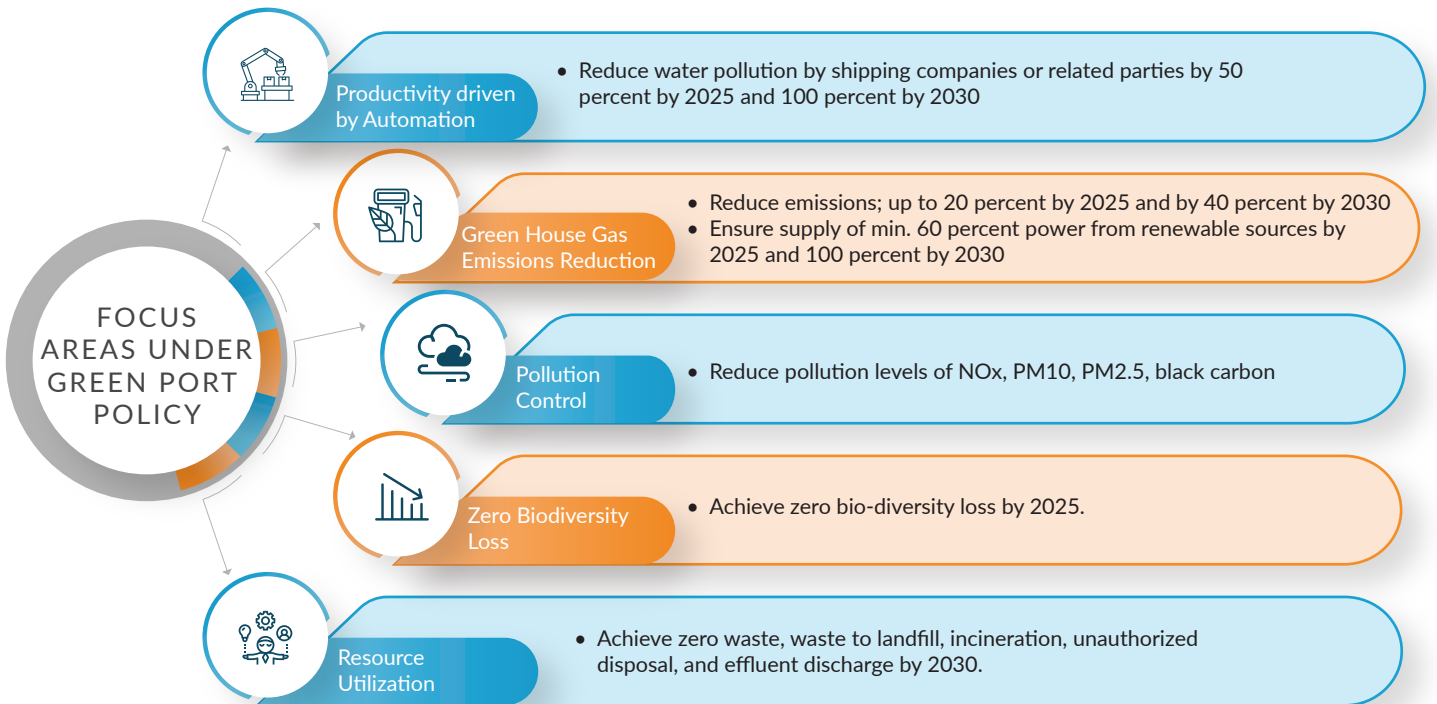
## Switching to Energy Efficient Operations – Green Port Policy

Phase I	Electrification of shore equipment
Phase II	Electrification of yard equipment and intra terminal trailers
Phase III	Providing shore power to vessels at berth

Thus, India ports and maritime sector shall focus on sustainability of:

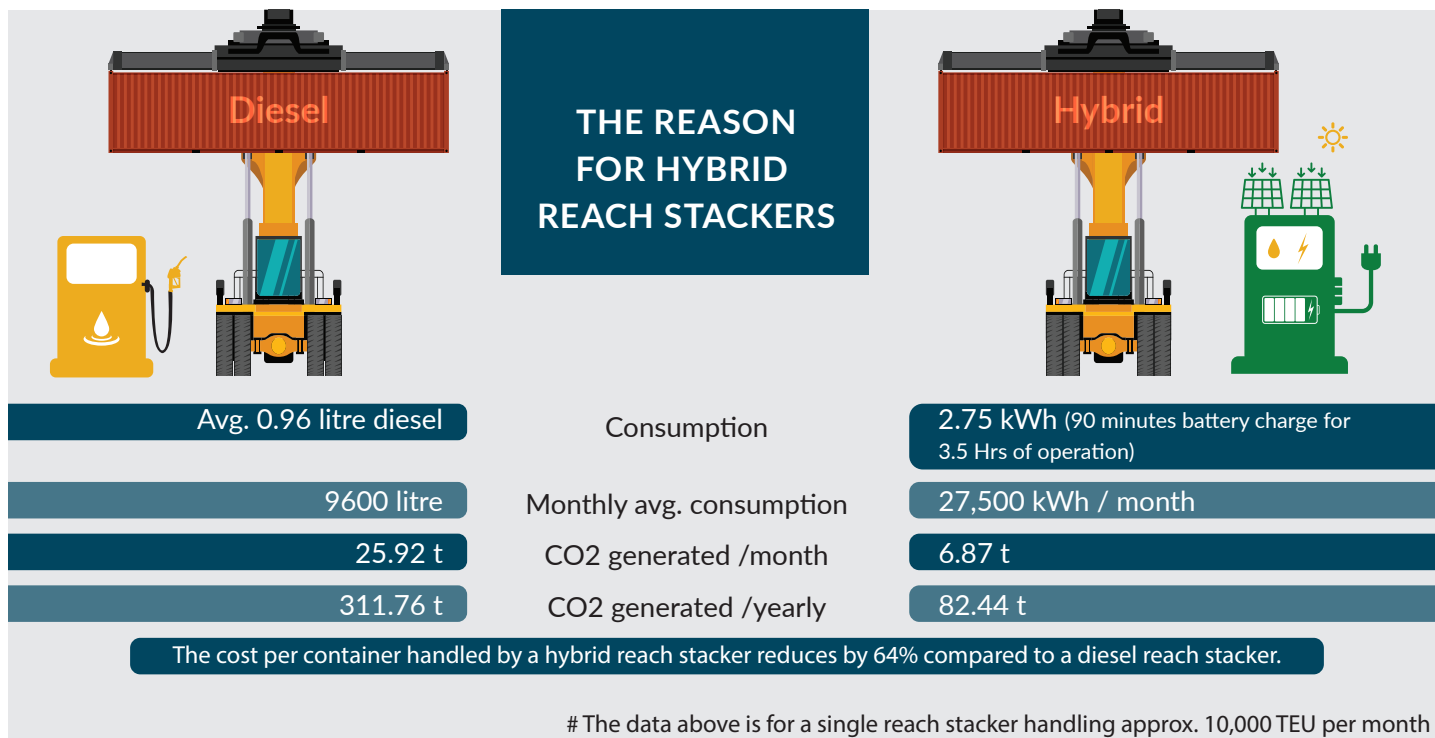
-  Increasing renewable energy
-  Improving air quality
-  Optimizing water usage and increasing green cover
-  Solid waste management
-  Dredging material recycling

## Key focus areas under Green Port Policy:



# Ports & Logistics

## Electrifying Port Performance



**P**orts are catalysts for economic development as they enable trade and support supply chains. As the Government of India looks to increase India's share in the world trade pie, the industry will continue to grow. This means that ports need to increase their ability to handle increasing capacities and become more efficient. That said, the Government of India is also focusing on sustainable growth with an eye on reducing CO2 emissions and increasing the share of renewable energy via its Green Port Policy. In this endeavour, ports are now electrifying mobile equipment like reach stackers, rubber tyred gantry cranes etc.

Reach stackers are used at container terminals and container freight stations for handling of various types of containers. They are a key piece of equipment which help stack containers quickly and safely.

### J M Baxi's take

J M Baxi Ports and Logistics (JMBPL) currently has a total of 40 reach stackers across all terminals and have recently adopted two hybrid reach stackers. Running on a combination

of solar power, grid electricity and diesel, the hybrid reach stackers are in operation at our Delhi Inland Container Terminal and Visakhapatnam Container Freight Station, and will gradually be deployed at our other facilities.





## In Focus

# The Phasing Of Older Ships

**T**he Indian Government has amended the age norms for Purchase and Chartering of Ships, prohibiting Indian shipping companies from buying older tonnage and prohibiting Indian trade from using older ships.

Concerned by the rising trend of marine accidents in Indian waters, and with an intent to have a more fuel-efficient fleet, the Ministry of Shipping in 2003 set up age norms for ships owned by Indian companies and also for ships chartered by Indian companies. A significant correlation was observed between the age of ships and the break-downs and accidents along the Indian coast. Hence the acquisition and chartering of younger ships were recommended. Since the implementation of the norms

prevalent over the past 20 years, instances of accidents along the Indian coast have reduced.

Global warming today has become a huge concern across industries, including the maritime sector. There is an increasing pursuit to reduce greenhouse gas emissions in the maritime sector and the International Maritime Organisation (IMO) has prescribed guidelines for adopting alternate fuels for ships. There has been rapid progress in using cleaner fuels, and the maritime community worldwide is working on building ships which can switch over from burning fossil fuels to using LNG, hydrogen, ammonia and methane as bunkers. While there are modifications happening for existing tonnage in some cases, the switchover is more viable for newer tonnage and thus

orders for many new vessels are being placed with an option of using clean fuels or dual fuels.

The Indian administration is pursuing Indian shipowners and charterers to scrap older ships and buy or charter modern tonnage. India ranks 17th in the world merchant fleet ranking and presently there are 1,520 ships registered under the Indian flag, comprising a total of 13.7 Mn gross registered tonnage and 20.6 Mn dead weight tonnage. Since there have not been many additions of newbuilds in the past few years by Indian companies, a majority of Indian ships are in the 16 years plus age bracket.

While the average age of the world's fleet has been improving over the years, India's fleet has been ageing and there was a need for India to get younger tonnage. Not many new





# In Focus



ships are being built under the Indian flag and most acquisitions are done through the second-hand route. The Director General of Shipping (DGS) of India thus felt the need of improving the age of Indian tonnage and has come up with new age norms for ships through its notice dated 24th February, 2023. The norms introduced were under discussion for over a year, with various stakeholders across India. These new rules apply to all ships required to be licensed by the DGS which means all ships registered in India, all ships engaged in coastal trade, and foreign-flag ships either operated under charter to Indian companies or trading within the exclusive economic zone (EEZ).

The new age limit for plying vessels in Indian trade across various categories is as follows:

- Tankers, Dry Bulk carriers, General cargo vessels, Offshore vessels (without dynamic positioning) - 25 years
- Chemical carriers, Gas carriers, Cellular container vessels, Offshore vessels with dynamic positioning, Harbour tugs, Specialised vessels, Accommodation barges - 30 years
- Dredgers – 40 years

- The rules cover all classes of ships except passenger ships and ships engaged in the energy trade i.e. Floating Storage Regasification Units (FSRU), Floating Production Storage and Offloading (FPSO), and drilling and production platforms.

Indian ship owners are now restricted from buying ships more than 20 years old. For oil tankers, cargo ships and most offshore vessels, there are also additional requirements to purchase ships between 15 and 20 years old. These are technical clearances by the administration and such clearances were earlier required for vessels between 20 to 25 years of age.

For chartering of ships serving Indian trade, ships currently operating have a three-year phase-out clause. While the order gets implemented immediately for future acquisitions or charters, existing tonnage gets a window of up to three years to comply with the

same. In case the charter of any vessel ends before three years from the date of the order, the dispensation would be allowed till the end of the charter period. The circular also mentions that the DG Shipping reserves the right to dispense any of the requirements, after considering inputs from the Indian National Shipowners Association or any relevant association on a case-to-case basis.

While there are no official statistics available, it is estimated that less than one percent of ship calls in India would be immediately affected. These are vessels that are over the 25-year age bracket and have been calling India regularly. While this doesn't seem to be too much of a concern, over 20 percent of the vessel calls at Indian ports are in the 20-25 years age category disabling these vessels from calling at Indian ports after few years, as they reach the new age limit. Indian charterers will have to look for more modern tonnage to serve their trade hence this segment is likely to be most affected. These are initial estimates and more details on these would be available as and when the government comes up with detailed statistics. However, in the meantime the trade is concerned about the possibility of some of the regular vessels getting out of the Indian market, leading to an increase in freight rates.

New-age ships will burn cleaner fuels and help the country achieve the target of zero carbon emissions set out at COP21. This needs to be married with India's aim, of attaining a larger share of the world's trade pie to ensure growth that is sustainable.

Age Composition of Indian Shipping fleet as on Dec 2021

Category	0-5y	6-10y	11-15y	16-20y	above 20y	Total
Coastal	114 (11.1)	158 (15.4)	184 (17.9)	96 (9.3)	475 (46.3)	1027
Overseas	19 (4.1)	80 (17.2)	111 (23.9)	76 (16.4)	178 (38.4)	464
Total	133 (8.9)	238 (16.0)	295 (19.8)	172 (11.5)	653 (43.8)	1491

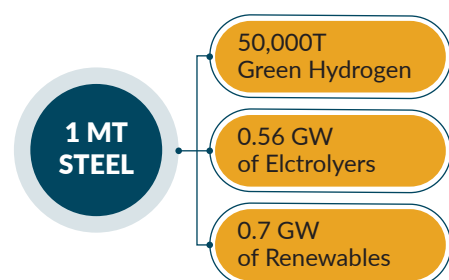
Figures within parenthesis represent share of fleet to the total fleets given row-wise

# Weights And Measures

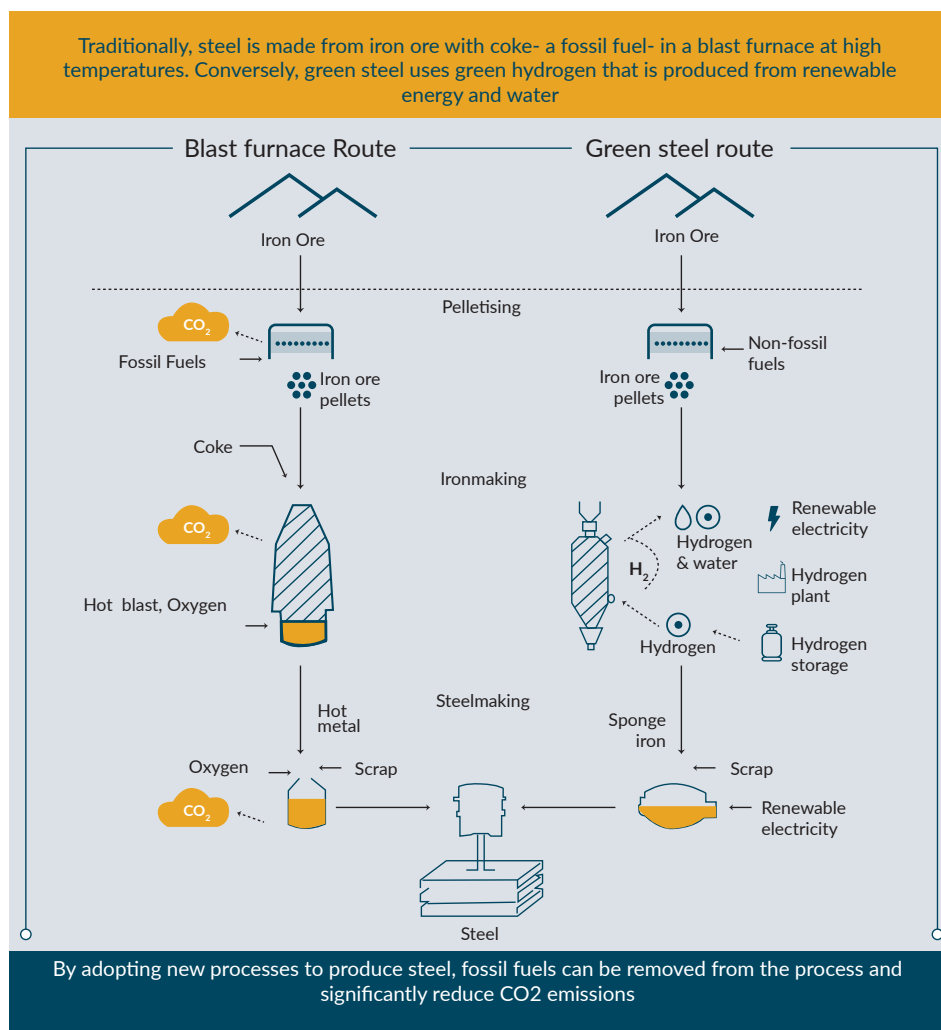
## Decarbonizing With Green Steel

Steel is the most commonly used material in the world. Every year more than 2 Bn ton of steel is manufactured, which makes it responsible for approximately 8 percent of the total CO<sub>2</sub> emissions globally. This makes the steel industry one of the most polluting and energy-hungry industries on the planet. To fight the environmental impact the industry causes, de-carbonizing steel has become the need of the hour. Major players like Tata Steel, JSW are already making efforts towards making steel sustainable. While recycling steel and its products account for 26 percent of global demand, manufacturing of steel through sustainable sources is key. Green steel is manufactured without the use of fossil fuels. It uses low-carbon energy sources such as hydrogen, coal gasification or electricity instead of the traditional carbon-intensive manufacturing route, through coal-fired plants. The use of green steel will eventually lower emissions, cut costs and improve the quality of steel while also reducing the industry's carbon footprint.

To produce green steel, the energy capacity and green hydrogen required would be as follows:



The green steel method uses hydrogen to reduce the iron pellets in sponge iron/metallic iron that can be used to produce steel. This process is done below the melting point of iron (800-1200C) saving energy costs.



Steel production source	Annual production (t)	Green Hydrogen req. (t)	Electrolyser capacity req. (GW)	Renewable capacity req. (GW)
U.S.A.	85.8	4.3	48	60
Europe	103	5.2	58	72
China	1032.8	51.6	581	726
Global	1951	97.6	1097	1371

### Green steel through scrap

India-based Kalyani Group has launched India's first green steel brand called Kalyani Ferresta.

It is manufactured using renewable energy resources enabling a zero

carbon footprint. Ferresta-branded steel has up to 70 percent scrap that is melted over an electric arc, which is powered by renewable energy sources. Through the new method, the company is able to eliminate a total of 76,484 carbon dioxide (tCO<sub>2</sub>) emissions, minimize water

# Weights And Measures

consumption by 10 percent, and was able to recycle 99.4 percent of its waste.

Demand for scrap will rise to 65 Mn ton per year by 2030. To ramp up steel scrap use, the country will have to improve both its collection processes and bring more scrap supply into the organised sector.

## Green steel - the need of the hour

According to ArcelorMittal Nippon Steel India, the iron ore and steel industry globally accounts for around 8 percent of total CO<sub>2</sub> emissions on an annual basis, whereas in India, it contributes 12 percent to the total CO<sub>2</sub> emissions. With such high emissions, steel producers in India and globally are facing escalating pressure from governments and investors, to reduce their carbon footprint from both environmental and economic perspectives. The Indian steel industry needs to reduce its emissions substantially by 2030 and hit net-zero carbon emissions by 2070. This is where green steel comes in.

Decarbonizing the steel sector is also important from the perspective of the emerging international regulatory landscape. For example, the European Union (EU) is set to charge a tariff on carbon emissions from steel imports from 2026 under its Carbon Border Adjustment Mechanism (CBAM), which is expected to be equal to the carbon price paid by European producers in the EU carbon market. As of 2019, the average emissions intensity of Indian steel was approximately 2.06 of carbon dioxide per ton, compared to the global average of approximately 1.45 per ton. This could put Indian steel exports at a disadvantage. Without any additional effort to decarbonize, Indian steel exports to

the EU could fall by as much as 58 percent in 2030.

## Green steel initiatives

In recent decades, the steel industry has achieved significant reductions in energy input and CO<sub>2</sub> emissions intensity. Increasing use of Electric Arc Furnaces (EAFs), as well as utilization of waste heat recovery technologies, have contributed to about 61 percent reduction in energy consumption per ton of steel produced since 1960. However, these improvements have not been sufficient to reduce the total absolute greenhouse gas emissions from steel production. There remains an estimated 15–20 percent improvement potential on the energy efficiency front.

Jindal Steel & Power Ltd. (JSPL) plans to develop its Odisha plant into the largest and greenest facility in the world. The company claims to be the first steelmaker in the world to build coal gasification to produce steel, using clean coal technologies.

Tata Steel's Netherland subsidiary has launched Zeremis Carbon, a green steel solution that offers a 30 percent reduction in CO<sub>2</sub> intensity as part of its aim to eliminate CO<sub>2</sub> emissions by 2050. The company has committed to switching to green hydrogen-based steelmaking. It is aiming to reduce CO<sub>2</sub> emissions by at least 30 percent by 2030 and to emit 75 percent less CO<sub>2</sub> by around 2035, with the ultimate goal of eliminating CO<sub>2</sub> emissions by 2050.

JSW Steel has earmarked approximately US \$ 1.21 Bn to increase the use of renewable energy to replace thermal power and other green initiatives. ArcelorMittal-Nippon Steel India, a joint venture between ArcelorMittal and Nippon Steel, has

committed around US \$ 33.5 Mn for various environmental initiatives including a zero liquid discharge system at its Hazira steel complex in Gujarat.

## Challenges

There are two basic steel production routes: the Blast Furnace (BF) route, where coke is the primary fuel, and the Direct Reduced Iron (DRI) route, where the fuel can be coal or natural gas. India presently produces around 90 percent of crude steel through the BF and coal-based DRI routes. While hydrogen has the potential to fully replace coal or gas in the DRI process, it is seen to have a limited role in being able to substitute coke in the BF route.

## Supporting infrastructure

There is an inadequate support network for the storage, production and transportation of hydrogen. This network infrastructure will have to be scaled significantly to ensure that the green hydrogen demand of approximately 8 ton by 2050 from the sector is met. For Carbon Capture Storage there is a lack of data on the availability of potential geological storage sites and their capacities. A comprehensive national study to assess these capacities is needed.

As India embarks on a journey of becoming a developed nation by 2047, its steel industry should exhibit strength and resilience in the face of a dynamic global marketplace. It must de-risk supply-chains, leverage digital solutions and deliver customer-focused products for world markets. The sector must operate from a position of advantage founded on strong cash flows. This will create enough headroom for making bold investments in ambitious projects to deliver sustainable value for all.



# Port Statistics

## SHIPPING AND CARGO PERFORMANCE

QUARTERLY UPDATES ON INDIAN MAJOR AND MINOR PORTS (QTY IN MILLION TON)  
OCT - DEC 2022 V/S OCT - DEC 2021

	LIQUID COMMODITIES & GASES									
	CRUDE OIL & OIL		CHEMICALS & LUBES		EDIBLE OIL & MOLASSES		ACIDS		LIQUIFIED GASES	
	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021
No of Ships Called	1320	1361	607	688	403	335	158	173	380	409
Total Cargo handled	74.46	72.73	3.87	5.01	4.71	4.11	1.74	2.09	9.52	10.57
Export	12.88	14.83	0.96	1.49	0.24	0.32	0.00	0.18	0.10	0.11
Import	61.58	57.90	2.91	3.51	4.47	3.78	1.74	1.91	9.42	10.46
	FINISHED FERTILISERS & FERTILISER RAW MATERIALS									
	UREA		SULPHUR		ROCK PHOSPHATE		DAP		MOP	
	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021
No of Ships Called	70	40	12	15	58	60	55	37	19	19
Total Cargo handled	3.04	1.84	0.39	0.55	2.35	2.49	2.53	1.71	0.66	0.60
Export	0.05	0.00	0.10	0.09	0.00	0.00	0.06	0.00	0.00	0.00
Import	2.99	1.84	0.29	0.45	2.35	2.49	2.47	1.71	0.66	0.60
	COAL AND COKE									
	NON COKING COAL		COKING COAL		MET COKE		PET COKE		OTR GRADES OF COKE	
	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021
No of Ships Called	786	610	304	285	26	33	54	47	36	18
Total Cargo handled	32.58	28.407	14.94	16.76	0.80	0.74	2.57	1.88	0.73	0.33
Export	0.21	0.003	0.05	0.24	0.03	0.29	0.00	0.14	0.11	0.01
Import	32.36	28.400	14.89	16.52	0.78	0.45	2.57	1.75	0.62	0.32
	OTHER BULK & BREAK BULK CARGO									
	CEMENT		MINERALS		IRON ORE		STEEL PRODUCTS & PROJECT CARGO		GRANITE	
	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021
No of Ships Called	135	137	461	412	205	212	380	488	34	47
Total Cargo handled	1.85	1.77	16.68	15.83	13.45	13.040	2.94	4.28	0.65	1.10
Export	0.76	0.68	5.95	4.03	8.29	5.810	1.01	3.15	0.65	1.07
Import	1.09	1.09	10.72	11.80	5.16	7.230	1.94	1.12	0.00	0.03
	AGRICULTURAL PRODUCTS & EXTRACTIONS									
	SUGAR		RICE		WHEAT		PULSE		EXTRACTIONS	
	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021	OCT - DEC, 2022	OCT - DEC, 2021
No of Ships Called	45	32	43	86	10	16	2	0	5	5
Total Cargo handled	1.28	0.63	1.22	2.28	0.25	0.47	0.08	0	0.03	0.03
Export	1.13	0.63	1.16	2.28	0.20	0.11	0.08	0	0.00	0.00
Import	0.15	0.00	0.06	0.00	0.04	0.36	0.00	0	0.03	0.03

\* Total Cargo Includes Liquid Cargo , Bulk Cargo and Other Cargoes and Excludes Containers

# Port Statistics

## INDIAN PORT PERFORMANCE

OCT - DEC 2022 V/S OCT - DEC 2021  
CARGO THROUGHPUT (QTY IN MILLION TON)

Ports	Types of Ports	NO. OF SHIPS		LIQUID CARGO		BULK CARGO		CONTAINERS (TEUS)		TOTAL CARGO *	
		OCT-DEC 2022	OCT-DEC 2021	OCT-DEC 2022	OCT-DEC 2021	OCT-DEC 2022	OCT-DEC 2021	OCT-DEC 2022	OCT-DEC 2021	OCT-DEC 2022	OCT-DEC 2021
KANDLA	PUBLIC	652	676	4.62	3.47	9.67	8.79	124,613	120,039	15.71	14.14
MUMBAI	PUBLIC	423	494	8.55	6.90	2.24	2.64	1,446,419	1,364,368	10.86	11.25
JNPT	PUBLIC	184	173	1.53	1.02	0.39	0.20	44,884	109,802	1.91	1.69
MORMUGAO	PUBLIC	87	81	0.21	0.01	3.45	3.42	0	0	3.70	3.58
MANGALORE	PUBLIC	333	308	8.04	5.01	2.02	1.80	37,101	0	10.11	8.92
COCHIN	PUBLIC	132	150	4.68	4.26	0.39	0.40	172,839	197,778	4.94	6.01
TUTICORIN	PUBLIC	166	232	0.36	0.35	4.38	4.13	42,567	40,188	4.92	5.63
CHENNAI	PUBLIC	229	185	3.63	2.33	0.71	1.22	367,671	419,696	5.00	4.29
ENNORE	PUBLIC	186	179	1.28	0.63	6.22	5.25	120,510	121,079	7.52	6.66
VISAKHAPATNAM	PUBLIC	387	468	4.02	2.67	9.41	11.22	115,728	126,930	14.44	15.35
PARADIP	PUBLIC	559	464	10.53	7.79	22.21	17.39	2,696	1,655	32.89	26.78
HALDIA	PUBLIC	444	425	3.63	2.55	5.27	4.08	21,613	35,503	8.94	8.01
KOLKATA	PUBLIC	18	16	0.03	0.01	0.02	0.04	140,649	138,844	0.06	0.07
GANGAVARAM	PRIVATE	79	86	0.00	0.30	4.79	5.48	307	0	4.81	5.78
PIPAVAV	PRIVATE	122	95	0.34	0.15	2.10	0.85	191,474	157,256	2.45	1.12
MUNDRA	PRIVATE	980	774	6.31	5.96	5.49	5.67	1,602,908	1,670,806	12.88	13.50
BEDI	PRIVATE	17	13	0.00	0.00	1.17	0.60	0	0	1.17	0.60
DAHEJ	PRIVATE	152	170	4.15	5.11	2.43	2.18	0	0	6.63	7.68
HAZIRA	PUBLIC	192	194	0.81	0.56	5.64	6.02	150,294	149,814	6.55	6.82
NAVLAKHI	PUBLIC	34	33	0.00	0.00	2.02	1.96	0	0	2.02	1.96
KAKINADA	PRIVATE	181	183	0.63	0.53	3.71	3.42	5,227	208	4.64	4.48
SIKKA	PRIVATE	377	390	31.04	20.33	0.00	0.01	0	0	30.91	33.55
VADINAR	PRIVATE	101	136	7.29	11.22	0.00	0.00	0	0	13.76	14.04
KRISHNAPATNAM	PRIVATE	198	175	0.45	0.35	9.04	7.59	38,486	12,876	9.70	8.37
KATTUPALLI	PRIVATE	18	16	0.04	0.00	0.16	0.08	171,900	97,841	0.24	0.16
BHOGAT	PRIVATE	7	7	0.58	0.55	0.00	0.00	0	0	0.58	0.55





## MARINE SERVICES

J. M. BAXI & CO.  
BOXCO SHIPPING SERVICES  
UNITED LINER SHIPPING SERVICES  
ARYA OFFSHORE SERVICES  
CONTAINER MOVEMENT  
(BOMBAY) TRANSPORT  
"K" STEAMSHIP AGENCIES  
EASTERN LINER SHIPPING

## PORTS & LOGISTICS

PROJECT HEAVY LOGISTICS  
COLD CHAIN LOGISTICS  
BULK LOGISTICS  
RAIL LOGISTICS  
KANDLA CONTAINER TERMINAL  
HALDIA CONTAINER TERMINAL  
VISAKHA CONTAINER TERMINAL I  
VISAKHA CONTAINER TERMINAL II  
TUTICORIN CONTAINER TERMINAL  
NHAVA SHEVA FREEPORT CONTAINER TERMINAL  
VISAKHA CONTAINER FREIGHT STATION  
MUMBAI CONTAINER FREIGHT STATION I  
NHAVA SHEVA DISTRIBUTION TERMINAL  
MUMBAI WAREHOUSING & LOGISTICS PARK  
DELHI INLAND CONTAINER TERMINAL  
INCHHAPURI INLAND CONTAINER TERMINAL  
PARADIP MULTIPURPOSE CLEAN CARGO TERMINAL  
VISAKHA MULTIPURPOSE CARGO TERMINAL  
ROZI BULK TERMINAL  
THE BALLARD PIER

## TECHNOLOGIES

DIABOS  
PORTALL  
ARYA WATER  
ARYA COMMUNICATIONS &  
ELECTRONICS SERVICES