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INTERVIEWS

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# ALANG'S SECOND ACT

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## EDITOR'S NOTE

# India's Ship Recycling Industry at a Turning Point



India's ship recycling industry stands at a defining moment. Four decades after the first vessel was beached at Alang, the country has emerged as the world's largest ship recycling nation. More importantly, the industry is undergoing a transformation that could reposition India as a global hub for safe, environmentally responsible and commercially competitive ship recycling. Alang, once synonymous with labour-intensive dismantling and environmental concerns, is gradually rewriting its narrative. With 115 of its 128 operational plots certified under the Hong Kong Convention, the industry has demonstrated its willingness to embrace international standards. Investments in infrastructure, worker safety, hazardous waste management and environmentally sound recycling practices reflect a significant shift from traditional shipbreaking to organised industrial activity.

The proposed inclusion of two Alang facilities in the European Union's approved ship recycling list represents another important milestone. If cleared, it would open access to EU-flagged vessels and strengthen international confidence in Indian recycling capabilities. However, certification alone cannot guarantee sustained business. Maintaining compliance, ensuring transparency and demonstrating consistent operational standards will be equally critical. The opportunity is substantial. An ageing global merchant fleet, tightening environmental regulations and the transition towards cleaner, more energy-efficient vessels are expected to accelerate ship retirements. India must position itself to capture this emerging recycling demand. Yet, challenges remain. Alang recycled 119 vessels in FY2025-26, considerably below its peak of 415 vessels in FY2011-12. Competition from Bangladesh, Pakistan and Turkey, fluctuations in scrap steel prices and the economics of vessel acquisition continue to influence business volumes. The industry also needs stronger financing mechanisms, modern equipment, skilled manpower and efficient downstream scrap processing facilities. There is a larger national opportunity here. Ship recycling should become an integral component of India's maritime industrial ecosystem, connecting shipbuilding, steel production, circular economy initiatives and green manufacturing. Recovered steel and reusable equipment can support domestic industries while reducing dependence on virgin raw materials. Government policy must therefore move beyond regulatory compliance towards creating a competitive and sustainable recycling ecosystem. Access to affordable finance, infrastructure modernisation, internationally recognised certification and stronger market linkages deserve priority.

India has already established its leadership in recycling volumes. The next ambition must be leadership in quality, safety and sustainability. Alang's transformation offers a compelling beginning. Converting that progress into enduring global competitiveness will determine whether India becomes merely the world's largest ship recycler or its most preferred destination.



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# DEALS *Roundup*

**Shore power, LNG, Coal, Shipbuilding: Check out what is the latest development in these industries**

## JNPA, IFC Partner on $70 Million Blue Finance for Shore Power

Jawaharlal Nehru Port Authority (JNPA) has partnered with the International Finance Corporation (IFC) for a US$70 million investment to develop shore power supply (SPS) infrastructure across JNPA's terminals. The initiative will enable vessels at berth to switch off diesel engines and connect to land-based electricity, reducing carbon emissions by an estimated 63% and harmful air pollution by up to 90%. The project is also expected to generate over 400 jobs. The financing marks the Asia-Pacific region's first labelled blue financing for port infrastructure aligned with the Blue Finance guidelines under the Indian Ports Act, 2025. It also represents the first development finance institution investment in India's state-owned major port authorities. The project aims to address commercial and operational challenges associated with large-scale shore power deployment at Indian major ports. IFC has also supported JNPA's Sustainable Finance Framework to mobilise further green and blue financing. The initiative aligns with Maritime India Vision 2030 and the Harit Sagar Green Port Guidelines, promoting cleaner and more sustainable port operations.




## India Plans Korea, Japan Visits to Secure Shipbuilding Investments

India's Ministry of Ports, Shipping and Waterways plans to send a delegation to South Korea and Japan in November 2026 to attract foreign investment in domestic shipbuilding and ship repair infrastructure. The initiative aims to secure anchor investors, facilitate technology transfer and strengthen partnerships with Indian shipyards. The government is pursuing a proposed $4 billion greenfield shipyard by South Korea's HD Hyundai at Thoothukudi, Tamil Nadu. However, a separate proposed joint venture between HD Korea Shipbuilding & Offshore Engineering and Cochin Shipyard for a block fabrication facility in Kochi was put on hold in August. The Centre has announced a ₹69,725 crore package to support shipbuilding, ship repair, recycling and maritime infrastructure. It has identified five greenfield shipbuilding clusters in Andhra Pradesh, Odisha, Tamil Nadu, Gujarat and Maharashtra, alongside three proposed brownfield facilities. India currently accounts for less than 1 percent of global shipbuilding output and aims to become one of the world's top 10 shipbuilding nations by 2030 and top five by 2047.

## Europe's LNG Demand and Growing Fleet to Pressure Shipping Rates This Winter

Global liquefied natural gas (LNG) shipping rates are expected to remain under pressure during the winter of 2026–27, as rising European demand for LNG and an expanding fleet of carriers increase vessel availability. According to Reuters, Atlantic LNG freight rates fell to $25,750 per day in October, from a peak of $287,500 in early March, while Pacific rates declined to $39,000 per day from $225,750. Europe's increased imports of US LNG in August and September have redirected cargoes from Asia and shortened voyage distances, freeing up more vessels. Around 55 new LNG carriers were delivered in the first seven months of 2026, with another 40–45 expected by year-end. Approximately 95 additional vessels are projected for 2027 and 80 for 2028. However, renewed Asian demand, volatility in regional gas prices and logistical disruptions could tighten vessel availability and trigger temporary freight-rate increases. Overall, expanding fleet capacity and shorter Atlantic voyages are expected to limit shipping-rate growth despite strong European LNG demand.



## India Targets $1 Trillion in Exports in FY27

India is on track to achieve its ambitious target of US$1 trillion in total exports during FY2026–27, according to Commerce and Industry Minister Piyush Goyal. The target follows record exports of approximately US$863 billion in FY2025–26, comprising merchandise exports of US$441.78 billion and services exports of US$421.32 billion. The government aims to achieve the target despite global economic uncertainties and an expected global trade growth of just 2.5–3%. Reaching US$1 trillion would require export growth of nearly 16% over the previous financial year. To strengthen export performance, India is pursuing Free Trade Agreements (FTAs), expanding access to international markets and encouraging greater participation by micro, small and medium enterprises (MSMEs). The government is also urging industry bodies to help businesses make better use of existing trade agreements.



## Coal India Increases Coal Supplies to Power Plants Amid Availability Concerns

Coal India Ltd (CIL) has stepped up coal dispatches to power plants amid concerns over fuel availability and rising electricity demand. In September 2026, coal supplies to the power sector increased 10.6% year-on-year to 48.9 million tonnes (MT), compared with 44.2 MT in September 2025. Overall coal supplies rose 12.5% to 61.2 MT during the month. The company supplied 302.8 MT to the power sector during the first half of FY2026–27, up 6.1% from 285.4 MT in the corresponding period last year. Its total coal offtake during the period reached 384.2 MT, marking a 7.6% increase year-on-year. To maintain supplies, CIL has drawn down 63 MT of accumulated pithead coal stocks during the first half of the financial year. Improved coal evacuation, coordination between production and dispatch, and mechanised handling infrastructure have also supported deliveries.

## Cochin Shipyard's International Shipbuilding Orders Exceed 40 Vessels

Cochin Shipyard Limited (CSL), India's state-owned shipbuilder, has orders for the construction of more than 40 vessels for international clients, including those from the United States, Germany and Norway, according to Union Minister for Ports, Shipping and Waterways **Sarbananda Sonowal.** The minister highlighted the orders as a sign of growing international confidence in India's shipbuilding capabilities, quality and manufacturing capacity. The government is working to strengthen India's shipbuilding ecosystem through investment, infrastructure development and international partnerships. The minister also noted interest from Russian entities in collaborating with Indian shipyards, while Belgium has expressed willingness to cooperate with India in shipbuilding. However, an important clarification followed: Cochin Shipyard subsequently stated that the reported orders were already reflected in its earlier stock exchange disclosures and did not represent newly secured contracts. The company stated it had no additional firm orders to announce at that time. The developments highlight India's efforts to expand its share of the global shipbuilding market and strengthen its position as an international shipbuilding and repair hub.

## India and ASEAN Fast-Track Trade Pact Review, Next Meeting in January 2027

India and the Association of Southeast Asian Nations (ASEAN) have agreed to accelerate negotiations to review the ASEAN–India Trade in Goods Agreement (AITIGA), with a focus on resolving pending issues, improving market access and modernising the existing trade framework. The decision was taken at the 15th AITIGA Joint Committee meeting held in Jakarta, Indonesia, from October 6–9, 2026. The Joint Committee directed all eight sub-committees to expedite outstanding negotiating chapters, establish time-bound deliverables and strengthen coordination to achieve measurable progress. Three sub-committees also held meetings covering legal and institutional issues, national treatment and market access, and rules of origin. Signed in 2009, AITIGA governs preferential trade in goods between India and ASEAN. The review aims to make the agreement more balanced, mutually beneficial and trade-friendly. India and ASEAN recorded bilateral trade of US$128.38 billion in FY2025–26, highlighting the importance of their economic relationship.



# SOHAR STEPS UP AS INDIA'S GATEWAY TO THE GULF

With the Strait of Hormuz effectively shut since February, Indian terminal operators are in talks to set up at Oman's Sohar Port, where feeder services from India have quadrupled and cargo volumes are rising at a record pace.

Indian logistics operators are in discussions to set up terminals at Oman's Sohar Port, as the Strait of Hormuz remains largely out of bounds amid ongoing hostilities between the US and Iran. Vessel passages through the strait now happen only under a strict and shifting clearance regime. Sohar, which sits outside the strait on Oman's Batinah coast, has emerged as one of the clearest winners of the shift.

The numbers make the case. Sohar handled 52 million tonnes of cargo in the first half of 2026, up 52% year on year, while container throughput rose 40% to 545,000 TEUs. Feeder vessel services between India and Sohar have quadrupled since the crisis began, according to **Raid Al Rubaiey,** Deputy CEO of Sohar Port.

## A strait under strain

The Strait of Hormuz has been closed to normal commercial traffic since 28 February 2026, for more than 225 days. Before the conflict, roughly 138 vessels crossed it daily, according to the Joint Maritime Information Center (JMIC). US-facilitated transits now average about 29 a day, and many move without broadcasting AIS signals.

The effects have rippled across the trade. Brent crude is trading above $105 a barrel, against about $72 before the crisis. War-risk cover for tankers is estimated at roughly 30 times pre-crisis levels, and five of nine major container carriers have advised customers that Hormuz services are suspended.

For Indian shippers, the closure cut off direct sea access to the GCC ports inside the Gulf. Shipping lines responded by calling at gateways outside the strait, such as Salalah, Khorfakkan, Sohar and Jeddah, pushing these ports well beyond their usual capacity. The GCC, comprising Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE, still needs its food, machinery, steel and consumer goods, and much of that cargo originates in India.

| Sohar Port, H1 2026 | Volume | Change vs H1 2025 |
|---|---|---|
| Total cargo | 52 million tonnes | +52% |
| Container throughput | 545,000 TEUs | +40% |
| Transhipment cargo | 24.38 million tonnes | - |
| General cargo | 1.24 million tonnes | More than doubled |
| Leased warehouse space | About 37,000 sq m | +19% |
| Vessel calls | About 1,555 | - |

## Sohar's growing pull

Sohar has pitched itself as an established industrial and logistics platform connecting businesses to regional and global markets. Total investments across the port and its freezone exceed $30 billion. The port handled 72 million tonnes of cargo in 2025, and the freezone signed eight new agreements worth $968 million that year, taking its six-year tally to $4.9 billion across 55 leasing agreements.

The first half of 2026, which spans the opening months of the crisis, shows how quickly volumes have moved.

The port contributes about 2.6% of Oman's GDP and supports nearly 42,000 direct and indirect jobs. Indian industry is already embedded here. Al Rubaiey said the port is in discussions with a number of Indian terminal operators interested in running facilities at Sohar. Dedicated terminals already exist, such as the Jindal facility, where the company operates two terminals as a captive operator. Both captive berths and multipurpose terminals for logistics operators are now being explored with Indian players.



## New lanes from Indian ports

Logistics players have spent most of the last six months adapting, building alternative supply chains to serve the GCC while the strait stays effectively closed. UAE-based DP World has started a new weekly service connecting Mundra and Nhava Sheva with Khorfakkan and onward global markets. It also runs a fortnightly service linking Cochin directly with Fujairah, Sohar and Aden.

Khorfakkan and Fujairah sit on the UAE's east coast, and Sohar lies a short road haul from the UAE border. Together they let cargo reach Gulf markets by land




without entering the strait. This geography explains why feeder services between India and Sohar have grown fourfold since February, carrying Indian-origin cargo bound for the GCC.

## A trade pact with good timing

The shift to Sohar coincides with a new chapter in India-Oman trade. The Comprehensive Economic Partnership Agreement (CEPA), signed in December 2025, entered into force on 1 June 2026. It gives duty-free access to 99.38% of India's exports to Oman by value, covering 98.08% of Oman's tariff lines, while India will eliminate or reduce duties on about 78% of its own tariff lines. The agreement explicitly highlights access to Oman's logistics hubs at Sohar, Duqm and Salalah as a route into wider GCC and East African markets. Bilateral trade reached $11.19 billion in 2025-26, up from $10.61 billion the year before, with Indian exports of $4.02 billion and imports of $7.17 billion. More than 6,000 India-Oman joint ventures already operate in the Sultanate, giving Indian terminal operators a ready base of partners and customers.

## Stopgap to strategy

Sohar is now positioning itself as a transhipment location for both GCC and African nations, a role its first-half numbers already reflect, with transhipment making up nearly half of all cargo handled.

For Indian operators, a terminal at Sohar would mean control over a gateway that serves the Gulf today and East Africa tomorrow.

**The shift to Sohar coincides with a new chapter in India-Oman trade. The Comprehensive Economic Partnership Agreement (CEPA), signed in December 2025, entered into force on 1st June 2026. It gives duty-free access to 99.38% of India's exports to Oman by value**

The pressure on ports outside the strait also makes the case for new capacity. Captive berths would give Indian manufacturers dedicated access, while multipurpose terminals would let logistics firms consolidate cargo for onward road and feeder movement across the region.

Whenever Hormuz reopens, the networks built during the crisis are unlikely to unwind entirely. Shippers have learned the value of a second route into the Gulf, and with CEPA lowering trade barriers, Sohar is well placed to turn a crisis-era detour into a lasting India-GCC corridor.

# FROM CLASSIFICATION TO CO-CREATION

## DNV's Deepening Role in Indian Shipbuilding

**Uday Chaitanya, Country Manager - India, Sri Lanka & Bangladesh, DNV Maritime,** discusses deeper yard partnerships, decarbonisation pressures on Indian shipowners, maritime skilling and why flexibility matters more than betting on a single fuel.

**DNV has worked with Cochin Shipyard for almost twenty years, and CSL's chairman has credited DNV-assured technology with giving the yard export credibility. As India's shipbuilding ambitions scale up, how is that partnership model evolving, and which other Indian yards are you replicating it with?**

Our relationship with Cochin Shipyard has gone well beyond classification. Over the years, we have worked closely with the yard as it has taken on more complex vessels and technologies, providing technical assurance and supporting its development of new capabilities. As India's shipbuilding ambitions grow, we are seeing this model develop further. With GRSE, for example, our recent MoU covers advanced shipbuilding, digitalisation, green technologies and competence development, including AI-enabled ship design, digital twins, cybersecurity and alternative fuels.

We have also signed an MoU with Swan Defence and Heavy Industries covering classification and statutory certification, technical and regulatory guidance, training, AI and digitalisation, as well as a proposed Centre of Excellence. The collaboration also looks at vessel electrification, hydrogen and ammonia, autonomous vessels and polar vessel development.

So we are increasingly working with Indian yards not just when a vessel is ready for classification, but earlier in the development process, helping them navigate new technologies, regulatory requirements and the competencies needed to build more advanced vessels.

**India's shipbuilding sector is gaining momentum. How well positioned are local yards to capture new opportunities at home and abroad?**

We are seeing a lot more interest in India as a shipbuilding market, and the conversations we have with yards are becoming more ambitious. It is not just about building greater capacity; there is a clear push towards more advanced vessels and technologies. That means the requirements placed on yards are changing as well. Digital technologies, alternative fuels, electrification and autonomous systems are all becoming part of the shipbuilding conversation, and that requires new technical expertise and ways of working. For yards looking to compete for international orders, understanding and meeting global regulatory and technical requirements will also be important. This is an area where DNV can support the industry, whether through classification, technical advice or helping to build the knowledge needed for new technologies. There is certainly an opportunity for India to play a larger role in global shipbuilding. How far that goes will depend on how the industry continues to develop its capabilities as the technology and regulatory landscape changes.

**Global regulations like the IMO's net-zero framework, EU ETS and FuelEU Maritime are increasingly extraterritorial, catching Indian-flagged and Indian-owned tonnage in their compliance net.**

> THERE IS CERTAINLY AN OPPORTUNITY FOR INDIA TO PLAY A LARGER ROLE IN GLOBAL SHIPBUILDING

**How prepared are Indian shipowners for this, and where are you seeing the most compliance anxiety?**

The challenge is not simply understanding individual regulations. Shipowners also have to make investment and operational decisions when the regulatory and fuel landscape is still changing.

We have seen this in our work with Great Eastern Shipping. The company has been taking a practical approach to decarbonisation, including improving energy efficiency, using biofuels where supply logistics allow, renewing its fleet with younger and more efficient vessels, and maintaining fuel flexibility. DNV has supported the company with decarbonisation plans, CII management and digital tools for EU ETS and FuelEU Maritime reporting. We are also seeing increasing attention on the infrastructure side of the transition. Through initiatives such as our work with GAIL and Deendayal Port Authority on LNG bunkering and methanol bunkering readiness at Kandla Port, the focus is not only on regulatory compliance but also on understanding how alternative fuels can be supplied and handled safely in practice. Ultimately, many owners are trying to make decisions in an environment where regulations,

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fuel availability and economics are all still evolving. For owners, having good emissions data is becoming increasingly important. It allows them to understand their exposure, test different scenarios and make better decisions rather than reacting to regulatory changes after they happen. The other challenge is that these decisions have long-term consequences. A vessel ordered today could be operating for decades, so owners need to consider not only today's requirements but how different regulatory and fuel scenarios could affect the vessel over its lifetime.

**What skilling gaps is DNV encountering on the ground (in digitalisation, alternative fuels or classification-related engineering), and how is DNV addressing them locally?**

One of the gaps we are seeing is the need to combine traditional maritime and engineering expertise with newer technologies. For example, naval architects, marine engineers and surveyors increasingly need to understand digitalisation, AI and the practical implications of alternative fuels, including the related safety and regulatory requirements. Our DNV white paper on 'The Future of Seafarers: A Study into the Challenges and Opportunities' also highlighted how digitalisation and automation are changing the skills profile of seafarers. They will need to work more closely with digital systems while retaining the maritime knowledge needed to make sound operational decisions. In India, we are addressing this through training and competence development, alongside technical and regulatory guidance. The focus is on helping maritime professionals understand how these technologies translate into vessel design, operations and safety. As the technology and regulatory landscape continues to evolve, keeping those skills current will be just as important as developing them in the first place.

**Your remit spans India, Sri Lanka and Bangladesh, three markets at very different points in their maritime development. How do you manage a coherent regional strategy across three such different neighbours?**

The starting point is understanding what each market is trying to achieve and where the opportunities and challenges are. Having experienced teams on the ground is important here. Their knowledge of the local maritime industry, customers and regulatory environment helps inform how we shape our priorities across the region. There are also common issues across these markets, such as safety, decarbonisation, technology, regulation and the need for new skills. We can draw on DNV's global expertise in these areas, while allowing enough flexibility to respond to the realities of each market. For me, it is about having a common direction across the region without trying to make every market follow exactly the same approach.

**What does DNV's latest Maritime Forecast to 2050 report tell us about the challenges and opportunities Indian shipowners facing over the next decade?**

I think the biggest takeaway from DNV's latest Maritime Forecast report is the level of uncertainty shipowners are dealing with. There are several possible paths for the industry, depending on how regulation, fuel availability and technology develop, and that makes long-term investment decisions more challenging. For Indian shipowners, that means it is difficult to make long-term decisions based on a single view of how the transition will play out. What is more practical is to look at measures that can improve efficiency today while keeping flexibility for different fuel and regulatory scenarios. We are already seeing this shift in the global fleet. Alternative-fuel-capable tonnage in the order book has grown from 0.4% in 2020 to 5.2% in 2026, although uptake varies significantly by vessel type and trading pattern. At the same time, fuel availability and infrastructure remain important constraints.

The opportunity for shipowners is not simply about choosing a fuel. It is about making investment decisions that remain viable as regulation, fuel availability and technology continue to evolve.

> **THERE IS CERTAINLY AN OPPORTUNITY FOR INDIA TO PLAY A LARGER ROLE IN GLOBAL SHIPBUILDING**

**The report tracks the industry's uncertainty over which alternative fuel ultimately wins. If you had to bet on the direction the global fleet tips towards by 2035, what would it be, and what's the one signal you're watching most closely to confirm or upend that bet?**

I would be cautious about betting on a single fuel. One of the key messages from this year's Maritime Forecast to 2050 report is that the transition is unlikely to follow a straight line, and there are still several possible pathways for the industry. If there is one signal I would watch most closely, it is whether the fuel supply chain starts developing with enough confidence on both sides: whether suppliers have confidence that demand will emerge, and whether shipowners can have confidence that the fuels will be available when they need them. That will be critical to moving alternative fuels from capability on board vessels to wider adoption. In the meantime, energy efficiency is one area where the industry can make progress regardless of how the fuel mix develops. For shipowners, that means making investments that deliver value today while keeping enough flexibility to adapt as the regulatory, fuel and technology landscape evolves.

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# ALANG'S SEC

## INDIA BETS BIG ON GREEN SHIP RECYCLING

Four decades after the first hull ran aground on its mudflats, the world's largest ship recycling belt is rebuilding itself around compliance. With India now the top recycler globally, two Alang yards on the cusp of European approval and a once-in-a-generation demolition wave on the horizon, **Maritime Gateway** visited Alang in August to see how the industry is preparing for what comes next.

The road from Bhavnagar to Alang runs about 50 kilometres south-west, through salt pans and small villages, before the horizon fills with the sterns of ships pulled up onto the shore. This is the Alang-Sosiya Ship Recycling Yard: a stretch of roughly 10 kilometres of the Gulf of Khambhat coastline, divided into 153 plots, where more than 8,900 vessels have been dismantled since the first, MV Kota Tenjong, was beached on 13 February 1983. When Maritime Gateway visited in August, the yard presented two stories at once.

The first is one of volume under pressure. Alang beached 415 ships at its peak in FY2011-12; in FY2025-26 it took 119. Many plots along the shoreline waited for their next hull. The second story is the one the industry wants the world to notice. Behind the plot gates, the practices of the 1990s have been steadily replaced by impermeable floors, drainage systems, hazardous material stores, crane-led block lifting, training certificates and audit trails.

Today, 115 of Alang's 128 operational plots are certified as compliant with the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships (HKC), which entered into force globally on 26 June 2025.

That transformation is now being tested on the biggest stage. In July 2026, the European Commission published a draft 16th edition of the European List of approved ship recycling facilities that, for the first time, proposes two Alang yards: Shree Ram Vessel Scrap and YSI Recyclers. If European Union (EU) member states approve the list, India could become the first non-OECD country with yards cleared to recycle EU-flagged ships.

At the same time, India overtook Bangladesh in 2025 to become the world's largest ship recycling nation, with 35.4 per cent of global gross tonnage recycled according to UNCTAD data cited by the Ministry of Ports, Shipping and Waterways.

To understand how a yard prepares for that standard, Maritime Gateway spent time with the **Bansal Group,** which operates Plot No. 25 (Bansal Ship Breakers Pvt Ltd) and Plot No. 39 (Bansal Ship Recyclers LLP). Its operations offer a window into how a mid-sized, family-run Alang business has rebuilt itself around compliance,



# COND ACT



## Alang-Sosiya fact file

| Indicator | Figure |
|---|---|
| Location | Alang-Sosiya, Talaja taluka, Bhavnagar district, Gujarat; Gulf of Khambhat, about 50 km from Bhavnagar |
| First ship beached | MV Kota Tenjong, 13 February 1983 (5 ships, 24,000 LDT in 1982-83) |
| Coastline and plots | About 10 km; 153 developed plots covering 3,98,803 sq m |
| Operational plots | 128 (Government of India, 2026); about 22 to 25 idle owing to legal or regulatory issues |
| HKC-compliant plots | 115 |
| Installed capacity | 4.5 million LDT a year (400 to 450 ships); master plan target of 9 million LDT by 2035 |
| Cumulative output | More than 8,900 ships since 1982-83 |
| Peak year | FY2011-12: 415 ships, 3.85 million LDT |
| FY2025-26 | 119 ships, 10,87,447 LDT (46 tankers) |
| Largest ship recycled | S.T. Mont, 83,598 LDT (December 2009) |
| Employment (GMB) | About 15,000 to 18,000 direct; about 5 lakh indirect, including some 800 second-ary-market shops |
| Workers trained | More than 1.57 lakh at the GMB Safety Training and Labour Welfare Institute (since 2003) |
| Share of India's ship recycling | About 98 per cent |

*Sources: Gujarat Maritime Board; PIB (Rajya Sabha reply, July 2026); Indian Masterminds; India Seatrade News; The Week. Employment estimates vary widely between official, industry and union sources.*

and what the wider shoreline must do to capture the next wave of tonnage.

### Alang by the numbers

Alang works because of its geography. The Gulf of Khambhat has one of the highest tidal ranges on India's west coast, a gently shelving seabed of firm sand and mud, and relatively little wave disturbance. At spring high tide, ships run up the beach under their own power and settle on the intertidal flat as the water recedes, giving recyclers access to the hull without a dry dock. The Gujarat Maritime Board (GMB), which owns the plots and leases them to recyclers, puts the yard's installed capacity at 4.5 million light displacement tonnes (LDT) a year, or roughly 400 to 450 ships. The volume curve tells a story of a long decline followed by stabilisation. Arrivals fell from the FY2011-12 peak through the last decade as freight markets recovered, steel economics changed and compliance costs rose. FY2024-25, at 113 ships, was the lowest count in more than two decades. FY2025-26 brought a modest recovery to 119 ships and nearly 10.9 lakh LDT, helped in part by older tankers, including sanctioned vessels from the so-called dark fleet, which accounted for about 32 per cent of the year's tonnage.

### How Alang works: from cash buyer to re-rolling mill

More than 98 per cent of vessels sold for recycling pass through cash buyers such as GMS, Best Oasis and Wirana. The cash buyer pays the owner, takes delivery of the ship as is, installs a delivery crew and re-flags it for its final voyage, before selling it on to a recycler against a letter of credit. Prices are quoted in US dollars per LDT, which is why the relative price paid by Indian, Bangladeshi and Pakistani recyclers decides where much of the world's tonnage ends up. Once a ship arrives off Alang, the process is governed by the Recycling of Ships Act, 2019, the Recycling of Ships Rules, 2021, and GMB's own regulations. The Directorate General of Shipping is the National Authority for Recycling of Ships, with an office in Gandhinagar, while GMB, the Gujarat Pollution Control Board (GPCB) and Customs handle permissions on the ground.

> **"WORKERS ARE NO LONGER DISPOSABLE DAY-LABOURERS; THEY ARE CERTIFIED INDUSTRIAL PROFESSIONALS"**
>
> **VIDYADHAR RANE**
> General Secretary, Alang-Sosiya Ship Recycling and General Workers' Association

The infrastructure that supports this sequence is shared across the yard. GMB built a Treatment, Storage and Disposal Facility (TSDF), operated by Gujarat Enviro Protection & Infrastructure Ltd, with a 70,000 cubic metre secured landfill for hazardous waste, a dedicated cell for asbestos and glass wool, an incinerator and an effluent treatment plant. The Safety Training and Labour Welfare Institute, running since 2003, offers free basic safety and gas-cutter courses. The Red Cross hospital at Alang was upgraded in January 2025 to a 35-bed Level III trauma centre, addressing one of the issues EU inspectors had repeatedly flagged.

The value chain does not stop at the beach. Alang's output feeds re-rolling mills, induction furnaces and hundreds of small traders who refurbish everything from marine engines to galley equipment. Re-rolling ship plate uses roughly 16 per cent less energy and emits about 58 per cent less carbon dioxide than making steel from iron ore, which is why recyclers argue that ship steel deserves a larger role in India's green steel conversation.

### Inside a compliant yard: the Bansal Group at Plots 25 and 39

The Bansal Group's story mirrors Alang's own. Bansal Ship Breakers Pvt Ltd was incorporated in 1991 and has operated from Plot No. 25 since 1996. In 2019 the group took over the concern that had run Plot No. 39 since 2002, now Bansal Ship Recyclers LLP. The business is led by founder and Chairman Kapoorchand Bansal,

**"IF SHIP RECYCLING IS CARRIED OUT IN A CONTROLLED AND PROFESSIONAL SETTING, IT IS PRESERVING AND SECURING THE ENVIRONMENT"**

**BANSAL GROUP**
COMPANY LITERATURE



*Maritime Gateway got to walk inside the ship prior to the completion of the recycling process.*

with his sons Rubal Bansal, CEO, who drives day-to-day operations, and Bharat Bansal, who the company describes as its innovation lead. The group's motto, printed across its corporate literature, is simple: "Let's do what's right for the environment." Bansal uses the intertidal landing method common to Alang: the ship comes to a final resting place in front of the facility, and after primary cutting, blocks and materials are moved directly from the intertidal zone onto an impermeable floor for further processing. The company's position is that materials leaving the ship should go straight to a place where any adverse effect can be fully managed. Its facility includes:

- Complete wastewater management, including drainage systems
- An occupational health centre with first-aid facilities
- Firefighting installations throughout the yard
- Storage for personal protective equipment (PPE)
- Dedicated waste storage rooms for different categories of waste
- Storage areas with impermeable floors for hazardous materials
- Separate storage for oily machinery and valuables
- Rest rooms and washrooms for workers

### Planning before the first cut

Every vessel at Bansal is handled under a Ship Recycling Facility Plan (SRFP), the management document both the HKC and the EU Ship Recycling Regulation require. It covers acceptance of a ship, hazard assessment and ship-specific planning, compliance with import requirements, the provision of food, water, first aid and health checks, the segregation of materials into reusables, recyclables, hazardous waste and other waste, and documentation of every disposal.

When a recycling enquiry comes in, the group assigns an in-house expert to the shipowner to explain the contract phase, vessel arrival and the role of local authorities. Because every ship is different, a dedicated Ship Recycling Plan is drafted before the first cut, using the owner's plans, the IHM and the yard's own pre-demolition inspection.

Preparation in the intertidal zone follows a checklist designed to cut pollution risk:

- Verifying the Inventory of Hazardous Materials in line with the HKC, and for EU-flagged vessels with the EU SRR, supplemented by additional surveys where needed
- Reducing bunkers and oils as far as possible before the ship is landed
- Marking and labelling hazardous areas based on the IHM and survey findings
- For tankers, inspecting

## Alang arrivals and tonnage, selected years

| Financial year | Ships | LDT | Comment |
|---|---|---|---|
| 2011-12 | 415 | 38.5 lakh | All-time peak |
| 2012-13 | 394 | 38.4 lakh | Post-peak plateau |
| 2015-16 | 249 | 24.3 lakh | Freight recovery slows supply |
| 2018-19 | 219 | 17.7 lakh | Recycling of Ships Act passed in 2019 |
| 2021-22 | 209 | 14.1 lakh | Brief post-pandemic uptick |
| 2022-23 | 131 | 11.5 lakh | High freight rates keep ships trading |
| 2023-24 | 125 | 9.4 lakh | Red Sea diversions extend ship lives |
| 2024-25 | 113 | 10.1 lakh | Lowest ship count in over 20 years |
| 2025-26 | 119 | 10.9 lakh | HKC in force; India becomes No. 1 globally |

## The journey of an end-of-life ship at Alang

| Step | Stage | What happens |
|---|---|---|
| 1 | Sale | Owner sells to a cash buyer; recycler buys from the cash buyer, usually on a $/LDT basis |
| 2 | Pre-arrival paperwork | Inventory of Hazardous Materials (IHM) and Ready for Recycling Certificate; recycler issues a statement of acceptance; ship-specific Ship Recycling Plan prepared and approved |
| 3 | Arrival and inspection | Ship anchors off Alang; Customs clearance; GMB and GPCB verify the IHM and grant beaching permission |
| 4 | Beaching | Ship is run ashore at high tide onto the recycler's plot in the intertidal zone |
| 5 | Decontamination | Fuel, oils and bilge water drained; hazardous materials marked, removed and sent to the GEPIL-run TSDF; gas-free certification before hot work |
| 6 | Primary cutting | Blocks cut on the ship and lifted by crane onto impermeable floors |
| 7 | Secondary cutting | Blocks cut to marketable sizes on impermeable floors; materials segregated |
| 8 | Downstream | Re-rollable plates to re-rolling mills; melting scrap to induction furnaces; machinery, furniture and fittings to the Sosiya second-hand market |
| 9 | Close-out | Statement of completion filed with the National Authority; waste disposal records maintained |

*Sources: Recycling of Ships Act, 2019 and Rules, 2021; National Maritime Foundation; GMB; Bansal Group Ship Recycling Facility Plan literature*

pump rooms and cargo tanks to obtain the certificate required to work safely
- Removing residues, cargo remnants, loose items, fuel and lubricating oils as far as practicable
- Keeping oil-spill kits and first-aid kits on board and onshore from landing until the job is done

### Cutting under control

Hazardous materials are identified, labelled, segregated and removed section by section, working from the forward part of the vessel towards the aft, with gas-free conditions maintained for hot work. Only then does cutting begin. Wherever possible, blocks fall inside the hull rather than outside it and are lifted by heavy-duty crane directly onto the impermeable floor, so that coated or oily sections never touch the sea or the sediment. Paint is removed where necessary, dirty blocks are cleaned before they reach the floor, and secondary containment is used for transfers when required. The company stresses that seawater is not allowed to enter the hull during recycling and that supervisors are trained to watch for spills and clean them up. Workers must wear eye and breathing protection throughout.



*Wherever possible, blocks fall inside the hull rather than outside it and are lifted by heavy-duty cranes*

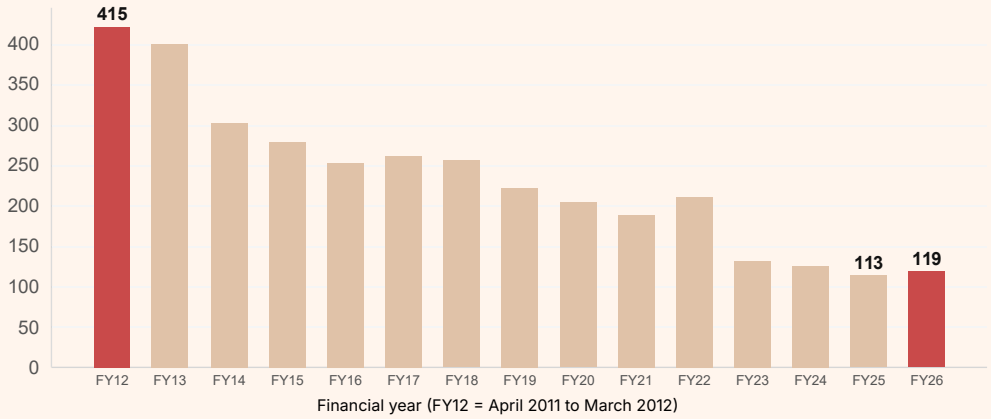
### Health, safety and people

Bansal's Health, Safety and Environment management system includes an Emergency Preparedness and Response Plan and a rescue team on alert around the clock. An Environmental Monitoring Programme tracks emissions to air, noise and vibration, releases to ground and sediment, and releases to water, with accredited laboratories brought in for testing. On the human resources side, the company points to accommodation for workers, regular medical check-ups, training by qualified trainers, PPE for every worker, and inspections of work areas by safety personnel before and during operations. Workers are also put through the GMB institute's programmes, which union leaders say have changed the profile of the Alang workforce. Bansal's literature also places its business in the circular economy. Ferrous scrap goes to melting and re-rolling mills that turn it into ingots, beams, bars, girders, plates and pipes for the construction sector, while machinery, furniture, appliances, paints, electrical equipment and fittings flow into the second-hand market. Using scrap instead of iron ore, the group argues, saves energy and lowers the carbon footprint of steel. It is an argument the whole of Alang is now making to European regulators.

### The compliance ladder: HKC, national law and the EU standard

Alang's yards now operate within three overlapping layers of regulation. At the base is Indian law: the Recycling of Ships Act, 2019, through which India gives effect to the HKC, requires every facility to be authorised for up to five years and every ship to have an approved recycling plan. Above that sits the HKC itself, which since June 2025 is binding on 24 contracting states including India, Bangladesh, Pakistan, Türkiye and Liberia. At the top sits the EU Ship Recycling Regulation (Regulation 1257/2013), which since 31 December 2018 has

## Alang ship arrivals, FY2011-12 to FY2025-26




required EU-flagged ships to be recycled only at facilities on the European List. For a yard owner, compliance now means a stack of certificates, each audited by a different party. A typical HKC-compliant Alang yard holds a statement of compliance from an IACS classification society such as ClassNK, Lloyd's Register, RINA or IRClass, along with management system certifications and its statutory authorisations. Those seeking European approval add an independent third-party verification and a series of Commission inspections.

## Indian yards and the European List, A timeline

| Date | Milestone |
|---|---|
| 2016 | First four Alang yards apply, certified by IRClass Systems and Solutions; ECSA-led fact-finding visit to Alang |
| 31-Dec-18 | EU SRR fully applies: EU-flagged ships may only be recycled at listed yards |
| 2018 to 2020 | Commission site inspections of Alang applicants, including Shree Ram and Priya Blue |
| Sep-19 | 19 Indian yards on the Commission's third-country applicant list, including Bansal (No. 029) |
| 26-Jun-25 | Hong Kong Convention enters into force |
| 27-Jan-26 | EU-India free trade agreement negotiations concluded |
| 27-Feb-26 | 15th European List adopted: 41 facilities, none in South Asia |
| 01-Jul-26 | Minister Sarbananda Sonowal meets EU Environment Commissioner Jessika Roswall; Joint Working Group proposed |
| 22-Jul-26 | Draft 16th List proposes two Alang yards: Shree Ram Vessel Scrap (Plots 78/81) and YSI Recyclers (Plot 59) |
| 30-Aug-26 | Public consultation closes |
| Sep-26 | BIMCO, ECSA, ICS, INTERCARGO, INTERTANKO, WSC, CLIA and Interferry back inclusion; NGOs and EU steel and recycling bodies oppose |
| Oct-26 | Member-state vote expected; list not yet published at the time of writing |

*Sources: European Commission; IRClass; PIB; Business Standard; BIMCO; gCaptain; Maritime Executive; SMM*

### Europe's verdict: A decade-long wait nears its end

Alang's pursuit of the European List began in 2016, when four yards, Priya Blue, Shree Ram, R.L. Kalthia and Leela, submitted applications backed by IRClass Systems and Solutions as independent verifier. By 2019 the Commission's list of third-country applicants carried 19 Indian names, Bansal among them. Commission-appointed inspectors visited Alang in 2018, 2019 and 2020, and their published reports acknowledged improvements on floors, drainage and training, while raising questions on primary cutting in the intertidal zone, emergency medical capacity and the handling of downstream waste that the Alang TSDF could not take, such as e-waste and batteries.

Since then, Alang yards and GMB have invested heavily in those gaps, from the trauma centre upgrade to further training and yard infrastructure, aided by Rs 53.5 crore from the Ferrous Scrap Development Fund. By mid-2026, more than 30 Indian yards had applied, six were in the compliance process and three had completed all steps, according to the Ministry of Ports, Shipping and Waterways.

> **"A LONG-AWAITED AND VERY WELCOME STEP, WHICH REWARDS THE INVESTMENTS THESE YARDS HAVE MADE TO MEET EU STANDARDS"**
>
> **SOTIRIS RAPTIS**
> Secretary General, European Community Shipowners' Associations (ECSA)

Industry has rallied behind the proposal. Global shipping bodies argued in a joint statement that the yards had invested to meet the standard and that the decision should be performance-based. Opponents, led by the NGO Shipbreaking Platform and joined by European steel and recycling associations, have urged the Commission to keep beaching yards off the list, arguing that tidal mudflats cannot meet the regulation's impermeable floor requirement. The final call now rests with member states. Rohit Agarwal, ship recycling industry expert, believes the process is slow but not stalled.

"My assessment is that the inclusion of Indian ship recycling yards in the 16th European List may take longer than the industry hopes, but the process is not necessarily heading towards rejection," he says. "I believe the final outcome will depend on whether the European Commission remains guided by its technical assessments, documented improvements

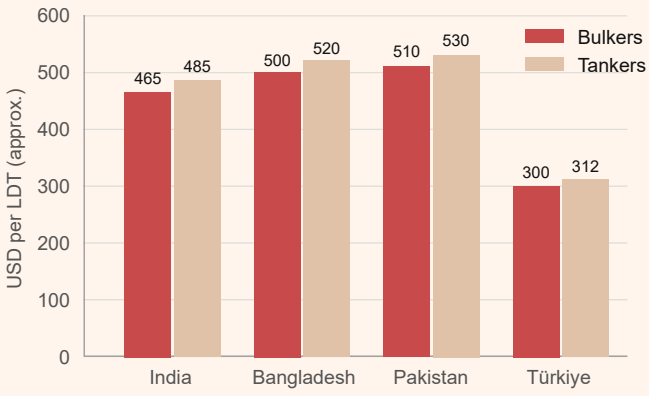


**"INDIA IS POTENTIALLY THE FIRST NON-OECD COUNTRY TO HAVE SHIPYARDS LISTED BY THE EU"**

**DARPAN JAIN**
Additional Secretary, Department of Commerce

and the requirements of the EU Ship Recycling Regulation, rather than broader political and competitive pressures. If the outstanding concerns are adequately addressed, inclusion remains a realistic possibility, although the timing is uncertain." For Agarwal, the stakes extend beyond India. "My expectation is that this process will ultimately test the consistency and credibility of Europe's own regulatory framework. Indian yards must continue strengthening compliance and demonstrating results on the ground, while the Commission must ensure that its decision is transparent, evidence-based and consistent with the law." The commercial logic is significant. A study by the NGO Shipbreaking Platform and Transport & Environment found that of 706 EU-flagged or EU-owned ships scrapped between 2019 and 2025, only 22 per cent went to EU yards, while up to 102 switched away from an EU flag shortly before sale. The Commission's own 2025 evaluation identified this flag-hopping as a major weakness of the regulation. Listing compliant Indian yards would give European owners a recognised, transparent option in the market where most of their tonnage already ends up.

**Indicative demolition prices, end of Q3 2026**




*Source: GMS Q3 2026 market review (week 39). Indicative levels; actual deals vary by ship.*

## Plots on the block: auctions, allotments and expansion

Alang's plots are not sold outright. They belong to GMB, which grants recyclers permission to use them for a fixed term. Under the GMB regulations of 2015, new, vacant or cancelled plots were offered through a tender-cum-auction process with an upset price per square metre per year, alongside development charges, rent and a recycling charge levied per LDT. Selling, sub-letting or mortgaging a plot was prohibited, and changes in partners required GMB approval.

That framework has been loosened in stages to match the industry's changing needs:

- **August 2024:** A policy for merging small plots, allowing recyclers to build wider frontages capable of taking larger ships.
- **March 2025:** Amendments capped merged plots at 300 metres in width, allowed GMB to offer unused plots each year to adjoining holders or existing recyclers, and introduced a minimum-LDT table by plot width in five-year blocks.
- **December 2025:** GMB floated a tender-cum-auction for permission to use 21 reserved plots at Alang-Sosiya (14 for Scheduled Tribe and 7 for Scheduled Caste categories) on an as-is-where-is basis through the nProcure platform, with bids due on 20 December 2025. Results have not been made public.
- **September 2026:** The GMB (Conditions and Procedures for Granting Permission for Utilising Ship Recycling Plots) Regulations, 2026 replaced the 2015 framework. Plot permissions now run for 15 years, renewable with state government approval, and plots can be realigned, merged, shifted or transferred more easily, with some charges reduced.

The 15-year term answers a long-standing industry demand. The Ship Recycling Industries Association (India) had asked for a policy horizon of 15 years or more so that recyclers could justify the capital expenditure that HKC and EU compliance demand, from impermeable

**"IF PRICING IN INDIA DOES NOT RESPOND QUICKLY, SHIPOWNERS WILL CONTINUE TO FAVOUR ALTERNATIVE MARKETS"**

**RAKESH KHETAN**
CEO, Wirana

**"THIS PROCESS WILL ULTIMATELY TEST THE CONSISTENCY AND CREDIBILITY OF EUROPE'S OWN REGULATORY FRAMEWORK"**

**ROHIT AGARWAL**
Ship Recycling Industry Expert

floors and heavy cranes to drainage and waste storage. Recyclers point to an HKC upgrade bill of between $ 0.56 million and 1.2 million per yard.

New plots south of Alang

The bigger opportunity lies in expansion. GMB's master plan targets 9 million LDT of annual capacity by 2035, double today's installed level, with a total outlay of about Rs 1,224 crore. Plans include new plots at Mathavada village, south-west of Alang, on a 2.9 km stretch with a dedicated landfill, incinerator and fuel treatment plant. GMB has a live tender for consultancy services for land acquisition to extend the existing yard towards the south under Phase 1, with bids due on 19 October 2026. The master plan's final report was issued in February 2026. Government vessels are another source of supply. The aircraft carrier INS Viraat, auctioned through MSTC and bought by Shree Ram Group for Rs 38.54 crore in 2020, set the precedent for naval ships ending their lives at Alang. Several Indian Navy and Coast Guard vessels decommissioned in 2025 and 2026, including INS Abhay and the Coast Guard patrol vessels Sarang, Meera Behn and Savitribai Phule, could follow the same route, although no disposal auctions have yet been announced.

## The market today: Price, competition and supply

Compliance alone does not bring ships to the beach; price does. Through much of 2026, Bangladeshi and Pakistani recyclers outbid Alang by about $ 35 to 50 per LDT, according to market reports. Indian recyclers face structurally tighter margins, partly because Bureau of Indian Standards rules keep re-rolled ship plate out of certified TMT bars, a rule recyclers estimate costs them Rs 5,000 to 7,000 per tonne. Ship steel meets about 2 per cent of India's steel demand, against a far larger share in Bangladesh.

Supply has been the other constraint. Strong freight earnings since 2022, driven by Red Sea diversions and geopolitical disruption, have kept older ships trading. Even so, India's compliance advantage is already visible in the global numbers. In 2025, India dismantled 111 ships, more than any other country, while Bangladesh's count fell by about a third.

## What the future holds

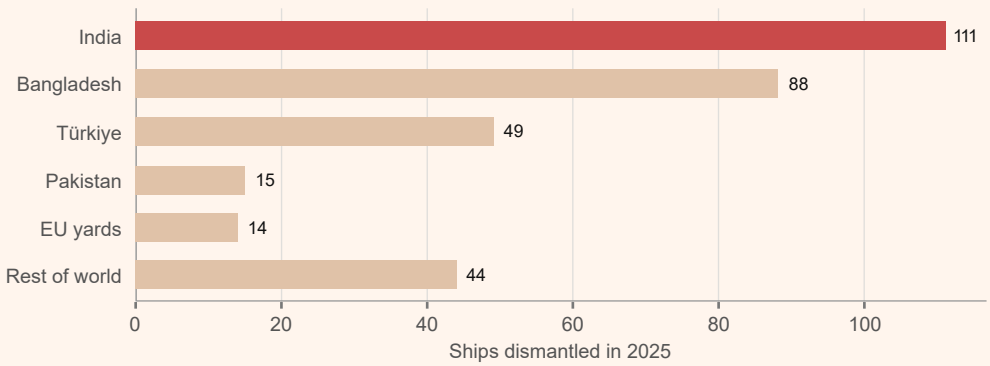
The next decade could be the busiest Alang has ever seen. BIMCO estimates that around 16,000 ships, totalling 700 million deadweight tonnes, will need to be recycled over the next ten years, and that from 2027 annual volumes could exceed the 2012 record. Market analysts at GMS describe the current lull as recycling being deferred rather than eliminated, with a backlog building that will be released once freight earnings normalise.

India is positioning to capture that wave on several fronts:

- **Shipbreaking Credit Note:** Part of the Rs 69,725 crore maritime package approved by the Union Cabinet in September 2025, the Rs 4,001 crore scheme gives shipowners a credit note worth 40 per cent of a ship's scrap value when it is recycled at an HKC-compliant Indian yard. The note can offset up to 5 per cent of the cost of a new ship built at an Indian shipyard, is valid for three years and is transferable. It links recycling directly to India's shipbuilding ambitions.
- **Capacity:** The master plan to reach 9 million LDT by 2035, the new 15-year plot regime and the southward extension of the yard.
- **Market share:** The government aims for India to handle close to half of global recycling, with a national target of 1,000 to 1,200 ships a year over the longer term, backed by ₹20,000 to 25,000 crore of investment over a decade.
- **European access:** A favourable vote on the 16th List would open EU-flagged tonnage to Alang for the first time and could bring more of the 30-plus applicant yards into the pipeline.
- **New clusters:** Tamil Nadu's Shipbuilding Policy 2026 offers a 15 per cent capital subsidy to the first five yards certified to HKC or EU standards, signalling interest in recycling beyond Gujarat.

Challenges remain. Price competitiveness against Bangladesh and Pakistan, the treatment of ship steel under Indian standards, the reliance on sanctioned tonnage in recent years, and the need to keep raising downstream waste and labour standards will all shape how much of the coming wave Alang captures. But the direction is clear. The yards that invested early in impermeable floors, documented procedures and trained workforces, as Bansal and its neighbours have done, are the ones best placed to welcome the next generation of ships, and the shipowners who now have to prove where their vessels end up. As the tide comes in over the mudflats of the Gulf of Khambhat, Alang is no longer asking the world to accept it as it was.

**Where the world's ships were recycled in 2025**




*Source: NGO Shipbreaking Platform annual list 2025 (321 ships worldwide). Rest of world derived.*

# WINGD KEEPS EVERY FUEL PATHWAY OPEN FOR SHIPOWNERS

**Dr Carmelo Cartalemi, Head of Strategic Marketing at WinGD**, speaks to **Ramprasad Ravi** on multi-fuel engines, the high pressure for large container ships, retrofits and India as the next growth market.

**WinGD offers dual-fuel engines across LNG, methanol, and ammonia. How do you help a shipowner decide which pathway fits their trade route and cargo type?**

First of all, WinGD does not believe there will be one fuel in the future. We believe the fuel will be selected based on the segment of the ship. Shipping is very fragmented, there are barges, tankers, gas carriers, container vessels, and every segment has specific needs. Shipowners have very good teams in place; they evaluate according to fuel availability, mission profile, trading pattern, and the price of the fuel versus the price of the vessel. There is no one fuel that wins. But there are different scenarios, and WinGD supports all of them, that's why we have a portfolio that includes LNG engines, both low-pressure and high-pressure, plus ammonia, methanol, ethanol, and LPG. We've seen that different applications point to different fuels.

**The IMO's Net Zero Framework was paused in October. Has that changed how suppliers are approaching fuel-choice conversations?**

A little bit. The uncertainty actually creates a cost in terms of $CO_2$ emissions, because when regulation isn't clear, what we've seen this year is much more traction for conventional fuel. There's no real clear business case for the owner, so future fuels get put on pause. On the positive side, though, at least for WinGD, that doesn't mean the vessel stays like that for its lifetime, because conventional can be converted. WinGD offers retrofits, all our conventional-fuel engines are upgradable to LNG, methanol, or ammonia. If you look at the majority of contracts, most have some form of "ready" built in: LNG-ready, ammonia-ready, methanol-ready. So we support that upgrade path.

**Your recent commentary argues LNG's business case is actually strengthened by the Net Zero Framework pause. Can you unpack that for our readers?**

Our paper shows that LNG has a benefit in terms of payback compared to other fuels, this is more linked to the cost of LNG than to decarbonisation. It's actually a bit of a paradox: what regulation wants is decarbonisation, but what the business case shows is that the lower-cost fossil pathway can still have an economic advantage over fuels that deliver much deeper GHG reductions. What does this mean? To decarbonize, to move from fossil fuel to an alternative fuel with zero or low greenhouse gas impact, we need two levers.
One is fuel economics, which is difficult to achieve on its own. The second, and most important, is the regulatory framework, the incentives and penalties on greenhouse gases need to be clear and predictable, and today that clarity is still missing at global level.

**What gap in the ultra-large container vessel (ULCV) segment is the high-pressure engine specifically designed to close?**

In the large container vessel segment, WinGD decided to launch the high-pressure gas engine because our Otto-cycle, low-pressure gas engine is typically less power-dense. For big vessels you need a lot of power, and at the same required power, the low-pressure concept can require additional cylinders, not ideal for container vessels, which need compact engine rooms. The market shows the high-pressure engine is more compact, so it makes more sense for this application.



**DR CARMELO CARTALEMI,**
HEAD OF STRATEGIC MARKETING AT WINGD

**Dr Carmelo Cartalemi** is the **Head of Strategic Marketing at WinGD**. He has a PhD in Mechanical Engineering from the University of Genoa, an MBA in Management Technology and Economy from ETH Zurich and a degree in Naval Architecture and Marine Engineering from the University of Naples.

In his current role as Head of Strategic Marketing, Carmelo is responsible for shaping WinGD's strategic market positioning and supporting the development of solutions that give shipowners the fuel flexibility and confidence they need as they navigate their decarbonisation journeys.

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> THE FIRST ENGINE IS SOLD BY SALES, BUT THE SECOND IS SOLD BY SERVICE. WE WANT A LONG-TERM RELATIONSHIP WITH THE OWNER



That said, the high-pressure engine isn't in competition with the low-pressure engine, we still have very valuable applications for low-pressure, like LNG carriers or medium-sized vessels. So high-pressure suits the big vessels; low-pressure suits gas carriers or medium-sized vessels.

**First deliveries are slated for 2028. What does the adoption curve look like so far among container lines?**

The response has been very encouraging. X-DF-HP was developed specifically around the requirements we are seeing from large container operators: very high power density, high efficiency and a compact installation. First deliveries are planned from 2028, and we are already seeing strong engagement around the 82- and 92-bore engines. What is important is that this gives container lines a high-pressure LNG option from WinGD while retaining the broader fuel-flexibility pathway of our engine platform. Ammonia for containers is still a little way off. It's not a technology issue, WinGD has demonstrated ammonia is a viable fuel; we have a vessel running on ammonia now, and the safety, efficiency, and emissions questions have been addressed. The real barrier for containers moving to ammonia is fuel availability and uncertainty. If shipowners don't see the fuel available, they won't commit, and that goes hand in hand with the regulatory framework.

**You've described WinGD Global Service as redefining customer expectations. What was missing in the aftersales market that prompted this move?**

On the service side, WinGD Global Service is very important because when you launch new-generation technology like LNG, methanol, or ammonia engines, we need to follow the customer very closely and help them maintain the vessel properly. That's why WinGD took the lead in providing a premium service, for all segments, all engines, all customers. It's launched with good success; we already have many service agreements in place and a lot of customer interest, and we're now expanding our global service network across all key locations.

**Does this aftercare push change WinGD's relationship with shipowners, from a one-time engine sale to something more continuous?**

Yes, absolutely, that's exactly what we want. We want to stay engaged through the lifetime of the vessel and the relationship with the shipowner. As we say, the first engine is sold by sales, but the second is sold by service. We want a long-term relationship with the owner, and that's what the service business is built to do.

**Coming to retrofits, your fuel economics report found that retrofit technology often isn't the limiting factor anymore. What is?**

The limiting factor isn't technology, the engine can be converted; we just need the contract to convert it. Next year we'll convert five engines from conventional to methanol, and a new ammonia conversion contract is coming soon too. It's also not really the capex, the initial cost. The limiting factor is



the benefit regulation needs to give to the alternative fuel to make the business case viable. If you're an owner, an investor, an asset player, you want your money returned reasonably quickly. Current regulation gives a payback period that's too long to be accepted. Incentives need to be higher to bring that payback within five years, because that's what investors want.

**How significant is the Indian and South Asian market to WinGD's order book right now, across new-builds and retrofits?**

India at the moment is a developing market. China, meanwhile, is hugely important, around 75% of the global order book is in China; it's the biggest shipbuilding country by far. Korea is also very important, and Japan too, even though it's a bit less prominent than ten years ago. Our business is focused on the Far East, and India is the next market, we've already appointed an agent and started sales activities. There's real interest from major Indian shipyards, and intention to build some tonnage there. We see the market very positively.

**When it comes to Indian shipowners, do you see them engage differently with fuel choices compared to European owners?**

A: No, not really. Indian shipowners, like others, are very interested in new technology, and all owners recognize the necessity to decarbonize shipping. The problem is always the same, the business case. In that respect, they're no different; their position is very understandable.

**What does your engine order book tell you about where the industry's fuel consensus is actually heading, versus where the conversation is heading?**

A: If you read the order book for the year, one word stands out: uncertainty. That uncertainty leads owners to stick with conventional engines. Everyone knows the direction to go, but the targets keep moving, the framework isn't clear, it's changing, and fuel availability is changing. So even though owners know they need to decarbonize, the conditions aren't there yet. For some owners, one rational response to that uncertainty is to select a conventional engine today while retaining a clear retrofit pathway for the future. That avoids paying the alternative-fuel premium before the fuel supply and regulatory picture is sufficiently clear. It's fully understandable.

> **THE REAL BARRIER FOR CONTAINERS MOVING TO AMMONIA IS FUEL AVAILABILITY AND UNCERTAINTY. IF SHIPOWNERS DON'T SEE THE FUEL AVAILABLE, THEY WON'T COMMIT, AND THAT GOES HAND IN HAND WITH THE REGULATORY FRAMEWORK**













# Andhra Pradesh Builds a Powerful Gateway to Maritime Growth

## Driving India's Next Wave of Port-Led Development

Andhra Pradesh is rapidly strengthening its position as one of India's most dynamic maritime states. With Visakhapatnam as its major port and five other commercial ports supporting trade activity, the state has emerged as a critical logistics and cargo hub on the eastern coast.

In FY26, Andhra Pradesh crossed a significant milestone by handling more than 209 MMT of total cargo. Visakhapatnam Port contributed 91.17 MMT, while other non-major ports handled 118.2 MMT. This growing cargo base highlights the increasing role of Andhra Pradesh in domestic and international trade.

At the same time, the state is expanding its maritime infrastructure through four deep-water greenfield ports currently under construction along with one captive port. These projects are being developed with Phase-I depths of 16.0 m CD to accommodate Panamax vessels and Master Plan depths of up to 20.2 m CD to accommodate Capesize vessels, supporting future cargo growth.

### Greenfield Ports Under Construction

**Ramayapatnam Port, Prakasam**
Ramayapatnam Port is being developed as a major maritime gateway on the Andhra Pradesh coast. The project has a Phase I capacity of 34.04 MMTPA, while its master plan capacity is 138.54 MMTPA. With an estimated project cost of ₹4,929.39 crore, construction is 82% complete. The port is targeted for completion by March 2027.

**Machilipatnam Port, Krishna**
Machilipatnam Port is progressing as an important logistics and maritime infrastructure project in Krishna district. The port is being developed with a Phase I capacity of 35.12 MMTPA and a master plan capacity of 115.97 MMTPA. The project involves an investment of ₹5,155.73 crore and has achieved 60.05% progress. Completion is targeted for August 2027.

**Mulapeta Port, Srikakulam**
Mulapeta Port is being developed in Srikakulam district to expand maritime capacity along the northern Andhra Pradesh coast. Its Phase I capacity is 23.5 MMTPA, with the overall master plan capacity reaching 83.5 MMTPA. The project cost is ₹4,361.91 crore, and construction has reached 76.5% progress. The targeted completion date is May 2027.

**Kakinada Gateway Port**
Kakinada Gateway Port is advancing as another significant addition to Andhra Pradesh's expanding port infrastructure. The project is designed with a Phase I capacity of 16 MMTPA and involves an investment of ₹4,221 crore. Construction progress currently stands at 33.4%, with the project targeted for completion by September 2028.

**AMNS Captive Port**
A captive port with a 2.9 km waterfront at Rajayyapeta–D.L. Puram, Anakapalli District, will serve the integrated steel plant at Nakkapalli. The port involves ₹11,198 Cr in two phases (Phase I: 20.5 MMTPA at ₹5,816 Cr; Phase II: ₹5,380 Cr), with Phase I targeted for completion by January 2029.

### FY26 Total Cargo

**209+ MMT**
Total Cargo

**91.17 MMT**
Visakhapatnam Port

**118.2 MMT**
Operational - Other than Major Ports

### At a Glance

**Andhra Pradesh** handled more than **209 MMT** of cargo in **FY26** and continues to strengthen its port network through the construction of four deep-water greenfield ports. In addition, development of Dugarajapatnam Shipbuilding Cluster along with AMNS captive port and major industrial developments in the port proximal area will strengthen Andhra Pradesh's strategic position along India's eastern coast.

# AIRPORTS & AVIATION INFRASTRUCTURE

## Expanding Andhra Pradesh's Aviation Network

Andhra Pradesh's aviation network handled 6.23 million passengers and 6,200 MT of cargo in FY26, with the State's overall passenger-handling capacity planned to rise from 15.5 MPPA to around 24 MPPA by 2036. Visakhapatnam remains the largest aviation market in the State, accounting for 48% of passenger traffic and 72% of air cargo.

## Expanding Capacity at Existing Airports

A major addition to the State's aviation infrastructure is Bhogapuram airport, designed for a capacity of 6.35 MPPA with a CAPEX of ₹5,640 crore. Alongside the airport, plans include an Aerocity, Aviation Hub and EduCity, creating a larger aviation-linked development around the project.

At Vijayawada airport, capacity is being expanded to 3.5 MPPA. The airport handled 1.41 million passengers, while its new terminal has reached 91.5% completion. Tirupati airport, with a capacity of 2.5 MPPA, handled 1.17 million passengers; its brownfield expansion has been approved and the airport currently connects to eight destinations.

Infrastructure expansion is also progressing at Rajahmundry, where capacity is being increased to 2.37 MPPA and the new integrated terminal is 97% complete. The airport handled 0.56 million passengers. At Kadapa, terminal works have reached 86% completion, while an RFP has been floated for the brownfield expansion of Kurnool airport.

### FY26 AT A GLANCE

| 6.23 Mn | 6,240 MT | 15.5 MPPA | 24 MPPA |
|---|---|---|---|
| passengers | cargo | current capacity | planned by 2036 |

## Five New Greenfield Airports

The next phase of aviation development includes five proposed greenfield airports at Dagadarthi, Kuppam, Srikakulam, Amaravati and Nagarjuna Sagar. These projects will expand the State's airport network beyond the existing aviation centres and provide new infrastructure for regions currently dependent on distant airports.

Among these, the proposed Amaravati airport is planned with a 4,000-metre runway and an initial capacity of 6.35 MPPA, with completion targeted for March 2031. The project will add dedicated aviation capacity for the Amaravati region as the capital area develops.

## Extending Regional Air Connectivity

The State is also planning 10 water aerodromes as part of its wider aviation programme. In parallel, heliports are proposed in every district, extending aviation infrastructure beyond conventional airports and creating a broader network of air-connectivity assets across Andhra Pradesh.














# MULTIMODAL CONNECTIVITY & INLAND MOVEMENT

## Integrated Rail, Road and Waterway Networks Supporting Port-Led Growth

Andhra Pradesh's freight network is built around the Chennai–Howrah, Chennai–Mumbai and Chennai–New Delhi corridors, creating strong connections between the state's ports, industrial centres and major national markets. The state is supported by 4,039 km of railway routes and a 23,300+ km road network, while dedicated last-mile links are being developed to connect new greenfield ports directly with the national transport system.

A further ~900 km of national waterways adds an inland freight dimension to this network. Together, these connections are being developed to support efficient cargo movement between ports, manufacturing clusters and inland markets, with 15–20 MMTPA of inland cargo movement targeted by 2030.






## CONNECTIVITY AT A GLANCE

| 4,039 km | 23,300+ km | ~900 km | 15-20 MMTPA |
|---|---|---|---|
| Railway Route | Road Network | National Waterways | Inland Cargo Target by 2030 |







## DIRECT RAIL LINKS TO PORTS

Dedicated rail connectivity is being developed across the state's emerging port network. Ramayapatnam Port is being connected to Tettu Station on the Chennai–Howrah route through a 7.2 km rail link, with a project cost of ₹111.58 Cr. The project achieved 35.42% progress and is targeted for completion by March 2027.

**Machilipatnam,** 8.22 km rail connection to Pedana Station on the BZA - Gudivada section is under development at a cost of ₹121.03 Cr. Progress stands at 15%, with completion targeted for March 2027.

**Mulapeta Port** rail link of 7.90 km connects to Dandu Gopalapuram Station. With an estimated cost of ₹283.21 Cr, the project has achieved 31.05% progress and is targeted for May 2027.

**Kakinada Gateway,** a 9 km rail link to Annavaram Station is planned and targeted to complete by September 2028. **Dugarajapatnam,** 38 km rail link from Gudur Junction is planned; the FLS has been sanctioned and the DPR is being prepared by SCoR.

## ROAD ACCESS BUILT AROUND PORT CAPACITY

Road connectivity is being developed in parallel with port infrastructure to enable faster cargo evacuation and direct access to the wider highway network.

**Ramayapatnam,** a 5.5 km four-lane road costing ₹36.53 Cr has reached 80.08% completion.

**Machilipatnam,** a 8.7 km six-lane road, with the ₹638 Cr project currently at tender stage. Machilipatnam - Vijayawada (NH-65), a 60 km six-lane road with the project cost of ₹1,773 Cr, approval awaited under PM Gati shakti

**Mulapeta,** a 12.5 km four-lane road is under execution with an estimated cost of ₹350.18 Cr. The project has achieved 34.90% progress.

**KGPL** connects via 4 lane Bharatmala connectivity to NH-16 which is 11km from the port and currently under development.

These port connections are complemented by strategic economic corridors. The 464 km Raipur–Visakhapatnam Economic Corridor is targeted for March 2027, strengthening east–west freight movement towards the Visakhapatnam region. The Bengaluru–Kadapa–Vijayawada Corridor has reached 73.21% completion, improving connectivity between Andhra Pradesh and major southern economic centres.

## INLAND WATERWAYS: EXTENDING PORT CONNECTIVITY

Andhra Pradesh's inland waterway network creates an additional freight channel alongside road and rail infrastructure.

**National Waterway-4 (NW-4)** a proposal is underway linking the NW-4 and Bandar Canal through a navigantional lock at Prakasam Barrage which connects Machilipatnam Port to Hinterlands. RFP under PPP mode is being issued.

**Development of Buckingham Canal** flows adjacent to the east coast of the State. Development of canal assists in connecting two ports and three Fishing harbours.

## INVESTOR TAKEAWAY

The significance of Andhra Pradesh's connectivity programme lies in the simultaneous development of port rail links, four- and six-lane road access, national economic corridors and inland waterways. For industries dependent on bulk cargo, container movement and port access, these projects are designed to reduce the distance between production centres, transport corridors and maritime gateways.

# LOGISTICS, SHIPBUILDING & INVESTMENT ECOSYSTEM

## Building scale across logistics, maritime infrastructure and shipbuilding



Andhra Pradesh is strengthening the physical and institutional infrastructure required for maritime-led industrial growth. The State's logistics strategy connects ports, airports, roads, waterways and warehousing, while the AP Logistics Policy provides a 25–30% capital investment subsidy for logistics parks. The incorporation of AP LINC in September 2026 creates an institutional platform for coordinating these interconnected logistics assets.

Alongside logistics infrastructure, Andhra Pradesh is advancing large-scale shipbuilding clusters and harbour development. The investment framework is supported by a 21-day single-window clearance mechanism, while the State's blue-economy strategy targets a US$20 billion economy by 2035.

### INVESTMENT SNAPSHOT

| | |
|---|---|
| **25-30%** Capital subsidy for Multimodal logistics parks | **September 2026** AP LINC incorporated |
| **US$20 Billion** Blue economy target by 2035 | **21 Days** Single-window clearance |













### LOGISTICS INFRASTRUCTURE TAKING SHAPE

A network of multimodal logistics parks is being developed across key industrial and port-linked locations. At Anakapalli, a 120-acre MMLP is being progressed under a PPP framework through NHLML and is at the DPR stage. The 109-acre Gondipalli MMLP has completed its DPR, while land acquisition is underway for the 350-acre Mulapeta MMLP, envisaging an investment of ₹1,347 crore.

At Sri City, the 63-acre Nexus Integrated Logistics Park is moving through land acquisition. These projects complement the two operational multimodal logistics facilities in Visakhapatnam; CONCOR across 98 acres and Balmer & Lawrie across 53 acres.

The State is targeting six Integrated Logistics Parks and six e-commerce hubs. Supporting this network is the AP Logistics Dashboard, which integrates datasets from eight Central Ministries and ten State Departments, creating a common information base for infrastructure planning and implementation.

### SHIPBUILDING AT INDUSTRIAL SCALE

#### Dugarajapatnam: A Major Shipbuilding Proposition

The proposed Dugarajapatnam shipbuilding cluster is planned across approximately 3,488 acres, supported by a 2.1 km waterfront and an 18-metre draft. The cluster is envisaged with an annual shipbuilding capacity of 1.2 million GT. With a proposed investment of ₹15,000 crore and employment potential of approximately 45,000 jobs, Dugarajapatnam represents one of the State's largest planned maritime-industrial developments. A Navratna defence PSU shipbuilder is envisaged as an anchor for the cluster.

| | | | |
|---|---|---|---|
| **3,488** Acres Planned cluster area | **1.2** Million GT Annual capacity | **₹15,000 Cr** Proposed investment | **45,000** Employment potential |

### MACHILIPATNAM: DEFENCE-LED SHIPBUILDING OPPORTUNITY

Machilipatnam is being positioned as another important shipbuilding location in Andhra Pradesh. The proposed development involves a defence PSU shipyard and an approximately ₹8,000 crore defence shipbuilding and ship-repair facility, extending the State's maritime manufacturing footprint along the coast. The project strengthens the State's broader strategy of maritime manufacturing capacity along with industrial-scale shipbuilding.

### Enhancement of Fisheries Infrastructure - Boosts Blue Economy of the State

Andhra Pradesh's maritime infrastructure development extends beyond commercial logistics and shipbuilding into fishing harbours, cold-chain systems and seafood infrastructure. The scale of the opportunity is reinforced by India's seafood exports, valued at ₹62,408 crore in FY25, while Andhra Pradesh's fisheries ecosystem supports approximately 50,000 fishermen families.

Under Phase-I, fishing harbours are being developed with an estimated cost of ₹1,439.29 crore. Progress has reached 95% at Juvvaladinne, 86% at Uppada, 81% at Nizampatnam and 72% at Machilipatnam.

The next phase covers harbour development at Pudimadaka, Budagatlapalem and Kothapatnam, with a combined investment of ₹1,468.02 crore. Together, these projects expand the infrastructure base required for fishing operations, landing, handling and downstream seafood logistics.

| | | | |
|---|---|---|---|
| **₹1,439.29 Cr** Phase-I (Uppada) fishing harbour investment | **₹1,468.02 Cr** Phase-II (Uppada) fishing harbour investment | **₹6,500 Cr** Estimated Fish Landings in 7 Fishing harbours | **50K** Benefitted Fishermen Families in Andhra Pradesh |

> "These maritime developments will catalyse the growth of Andhra Pradesh's maritime ecosystem and position the State as a leading maritime hub in the country."



# EYES ON THE WATER

## INDIA'S MARITIME SURVEILLANCE MOMENT

From radar satellites to AI-driven fusion centres, the business of watching the sea is moving into orbit. India has the coastline, the talent and now the policy push to lead it. What it still lacks is scale.

**Kalpana Pandey**

On 28 January 2026, the tanker MT Asphalt Star went quiet. For almost 11 hours, it switched off its Automatic Identification System (AIS) and VHF sets while operating in Pakistani waters, according to a Mumbai police FIR. Days later, the Indian Coast Guard intercepted it with two other vessels, Al Jafzia and Stellar Ruby, about 100 nautical miles off Mumbai. The three were accused of illegal ship-to-ship transfers of fuel oil and bitumen inside India's Exclusive Economic Zone (EEZ), using forged papers and AIS spoofing. All three sit on the US Treasury's sanctions list. The Coast Guard said surveillance and data analytics led it to the ships.

That one line captures where maritime security is heading. Patrol vessels and aircraft still make the arrest, but the first sighting increasingly comes from space: a radar satellite that sees a hull where no transponder is talking, and software that flags



the mismatch. For India, with a coastline now measured at 11,099 km and a sea lane that carries most of its trade, this is no longer a niche defence topic. It is a market, a policy priority and an investment case.

## From snapshots to a persistent watch

Maritime surveillance is a $24.3 billion global market today, and Grand View Research expects it to reach $ 35.8 billion by 2030, growing at 6.9% a year. Most of that spend still goes on coastal radar, patrol assets and command systems. The fastest-moving slice, though, is space-based surveillance: a market of over $ 1 billion, with about 35% of its 2030 opportunity expected to come from security and law-enforcement users. Three technologies do the work, and their value lies in how they combine.

- **Synthetic Aperture Radar (SAR)** satellites image the sea day or night, through cloud and monsoon. A SAR pass shows every hull on the water, whether or not it wants to be seen.
- **AIS and LRIT** are the transponder systems most commercial ships must carry. They broadcast identity, position, course and speed. Satellite-AIS extends this beyond the reach of shore stations.
- **Data fusion and AI** platforms lay SAR detections over AIS tracks. A radar return with no matching AIS signal is a "dark" vessel. Machine learning then flags loitering near protected areas, ship-to-ship transfers and dark rendezvous.

The shift now underway is from occasional satellite snapshots to near-continuous coverage. Small, cheap SAR satellites flown in constellations are cutting revisit times from days to hours, and in some plans to under an hour. Platforms such as Global Fishing Watch, Skylight and SeaVision have put dark-vessel analytics in the hands of smaller coast guards and fisheries agencies.

## What this means right now

- **Sanctions enforcement has gone maritime.** Shadow-fleet tankers carrying Russian, Iranian and Venezuelan oil rely on AIS gaps, spoofing and mid-sea transfers. India's February 2026 interdiction was described as its first hard signal against the shadow fleet.
- **Enforcement agencies need evidence, not tip-offs.** Persistent, time-stamped imagery gives coast guards a record of what a ship did, not just where it said it was.
- **Data sovereignty is now a strategic question.** States without their own satellites depend on foreign providers for basic awareness of their own waters, a "space divide" that India is working to close.
- **Undersea cables, offshore wind and oil assets need watching too.** Infrastructure protection is growing alongside traditional security uses.

**The fastest-moving slice, though, is space-based surveillance: A market of over $ 1 billion, with about 35% of its 2030 opportunity expected to come from security and law-enforcement users**

## Who uses it, and for what

The same SAR-plus-AIS picture serves very different customers. A navy wants to know what is moving in its approaches; an insurer wants to know where a hull was last Tuesday.

## Where the gaps are,

| Application | What it detects | Main Users |
|---|---|---|
| **Maritime security and border protection** | Unidentified craft, intrusions, suspicious loitering near the coast | Navy, Coast Guard, coastal police |
| **Sanctions and shadow-fleet monitoring** | AIS gaps, spoofing, ship-to-ship transfers | Coast guards, customs, sanctions authorities, banks |
| **Illegal, unreported and unregulated (IUU) fishing** | Dark fishing vessels in EEZs, protected areas and seasonal-ban zones | Fisheries departments, coast guards, regional bodies |
| **Narcotics, arms and human smuggling** | Small craft and dhows on unusual routes, mid-sea rendezvous | Coast Guard, NCB, DRI, state ATS units |
| **Oil-spill and pollution detection** | Slicks and illegal discharges, traced back to the source vessel | Pollution-response agencies, port authorities |
| **Search and rescue** | Last known position of vessels in distress | Coast Guard, MRCCs |
| **Critical infrastructure protection** | Vessels loitering over undersea cables, pipelines, offshore rigs and wind farms | Energy and telecom operators, navies |
| **Port and traffic management** | Anchorage congestion, arrivals forecasting | Port authorities, terminal operators |
| **Commercial intelligence** | Vessel behaviour, voyage history, cargo flows | Insurers, charterers, commodity traders, compliance teams |
| **Climate and ocean research** | Ship emissions, sea ice, ocean-use mapping | Research institutes, multilateral agencies |

## and where the money should go

India has built the backbone. Since the 2008 Mumbai attacks it has added a coastal radar chain, naval communication satellites (GSAT-7 and GSAT-7R) and the Information Fusion Centre–Indian Ocean Region (IFC-IOR), which shares a fused maritime picture with partner navies. The SBS-3 programme will put 52 surveillance satellites in orbit by 2029, 31 of them built by private firms. In August 2025, IN-SPACe picked a PixxelSpace-led consortium, which includes PierSight, SatSure and Dhruva Space, to build India's first commercial earth observation constellation: 12 satellites, SAR among them, at over ₹1,200 crore. The gaps are in what sits between the satellite and the decision.

## Domestic opportunities

- **Revisit, not just resolution.** A dark tanker needs only a few hours to complete a transfer. Constellations that cut revisit times over the Arabian Sea and Bay of Bengal are the core need, and that means more small SAR satellites in orbit.
- **Ground segment and downlink.** Fast tasking and downlink stations, including in the Andamans and Lakshadweep, decide whether data arrives in minutes or hours.
- **Analytics and fusion software.** The largest value pool. Indian firms can build dark-vessel detection, behaviour models and alerting tools for the Navy, Coast Guard, fisheries departments and ports.
- **Last-mile access for states.** Coastal states run their own fisheries and marine police, but few can buy or read satellite data. Subscription services for state agencies are a largely untapped market.
- **Port and commercial users.** Major ports handled about 915 million tonnes of cargo in FY26. Terminal operators, insurers and charterers are natural buyers of vessel-behaviour data.
- **Components and payloads.** SAR antennas, RF payloads and AIS receivers remain import-heavy. SBS-3 orders give suppliers such as Astra Microwave, Data Patterns and BEL a domestic anchor customer.

## Opportunities abroad

- **Indian Ocean partners.** Island states and littoral countries from Mauritius to Sri Lanka lose fish and revenue to dark fleets but cannot afford their own satellites. Indian data services, offered through IFC-IOR links or development aid, fit India's regional security role.
- **Global platforms.** The PierSight–KSAT model, Indian sensor and European distribution, shows how Indian firms can sell into established global customer bases instead of building one from scratch.
- **Trade pacts as a door.** EFTA's $ 100 billion investment goal under TEPA and the newly concluded India–EU FTA open routes for joint ventures, ground-station partnerships and co-investment with Norwegian, Swiss and European space firms.
- **Africa and Southeast Asia.** The Global Fishing Watch study places most dark fishing fleets in African and Asian waters. Fisheries monitoring there is a clear export market.

## The constraints

**Platforms such as Global Fishing Watch, Skylight and SeaVision have put dark-vessel analytics in the hands of smaller coast guards and fisheries agencies**

- **Anchor demand.** Startups need multi-year government data-purchase contracts, not one-off pilots, to bank their constellations.
- **Data policy.** Clear rules on who can buy, share and resell high-resolution maritime data will decide how fast the commercial market grows.

## The road ahead

The next three years will decide whether India is a buyer or a seller in this market. By 2029, SBS-3 should be in orbit, the IN-SPACe constellation phasing in, and PierSight's Varuna 2.0 flying with more satellites to follow. If those assets come with steady government demand and open commercial rules, India can watch its own waters with its own data and sell that capability across the Indian Ocean.

The ships will keep switching off their transponders. The question is how long they can stay unseen. bitumen inside India's Exclusive Economic Zone (EEZ), using forged papers and AIS spoofing. All three sit on the US Treasury's sanctions list.

The Coast Guard said surveillance and data analytics led it to the ships. That one line captures where maritime security is heading.

## By the numbers

| Figure | What it measures | Source |
|---|---|---|
| 75% | Share of the world's industrial fishing vessels not publicly tracked (2017–2021) | Global Fishing Watch, Nature, Jan 2024 |
| 25% | Share of transport and energy vessel activity missing from public tracking | Global Fishing Watch, Nature, Jan 2024 |
| 7 in 10 | Fishing vessels detected that were in Asia (vs 1 in 10 in Europe) | Global Fishing Watch, Nature, Jan 2024 |
| Up to 26 million tonnes | Fish caught illegally each year, worth about $ 23 billion | FAO |
| 55% | India's share of Russian crude sold via shadow tankers in 2025 | Drishti IAS, citing industry data |
| $ 24.3 bn → 35.8 bn | Global maritime surveillance market, 2024 to 2030 (6.9% CAGR) | Grand View Research |
| $ 1 bn+ | Global space-based maritime surveillance market | Research and Markets |
| 11,099 km | India's coastline after the 2024 re-measurement (up from 7,516.6 km) | Government of India |
| 52 | Surveillance satellites under India's SBS-3 programme, 31 built by private firms, ₹27,000 crore | SBS-3 reporting, Jun 2026 |
| $ 8.4 bn → 44 bn | India's space economy, 2022 to 2033 target; earth observation $ 8 bn of it | IN-SPACe / FICCI-EY |

# INSIDE THE ORBIT

## DARK SHIPS, DATA AND INDIA'S PLACE IN THE CHAIN

Ahmedabad-based PierSight, founded by former ISRO scientist Gaurav Seth, launched its technology demonstrator Varuna in December 2024 and calls itself India's first maritime-focused SAR constellation company. In September 2026 it signed a Letter of Intent with Norway's Kongsberg Satellite Services (KSAT) to evaluate integrating its SAR and AIS data into Vake Powered by KSAT, a maritime awareness platform. Varuna 2.0, its first commercial SAR-plus-AIS satellite, is due in 2027, the first step towards a 32-satellite constellation. Maritime Gateway put three questions to PierSight.

**Is this level of surveillance limited to a global commercial platform, or will it also support India's domestic security?**

"The collaboration makes us a potential data provider to KSAT's earth observation platform, which is used by parties interested in monitoring oceans worldwide, across their customer base. PierSight will be generating the data for the region for domestic customers regardless. The medium in which India receives this data is for India to decide, through KSAT's Vake or not. In this collaboration, PierSight is one of the sources of data, a space-based sensor. That is evaluated differently from the dissemination platform for coastal surveillance, which could be KSAT's."

**Surveillance raises privacy and ethical questions. Where does PierSight draw the line?**

"SAR and AIS together identify vessels that are either already transmitting their location and heading, or are hiding it. As an earth observation and remote sensing company, our job is to inform authorities if there are undisclosed vessels operating in their area of responsibility. We do not delve into personal details and only track what needs to be broadcasted under SOLAS and especially inside zones defined by UNCLOS."

"For cases like IUU fishing, persistent visibility over waters is needed. Authorities lose billions worldwide to illegal fishing. Governments set rules around seasonal bans, try to prevent overfishing, ensure fishing vessels are safe during emergencies and secure their economic zones. It is vital they know what is going on in the waters."

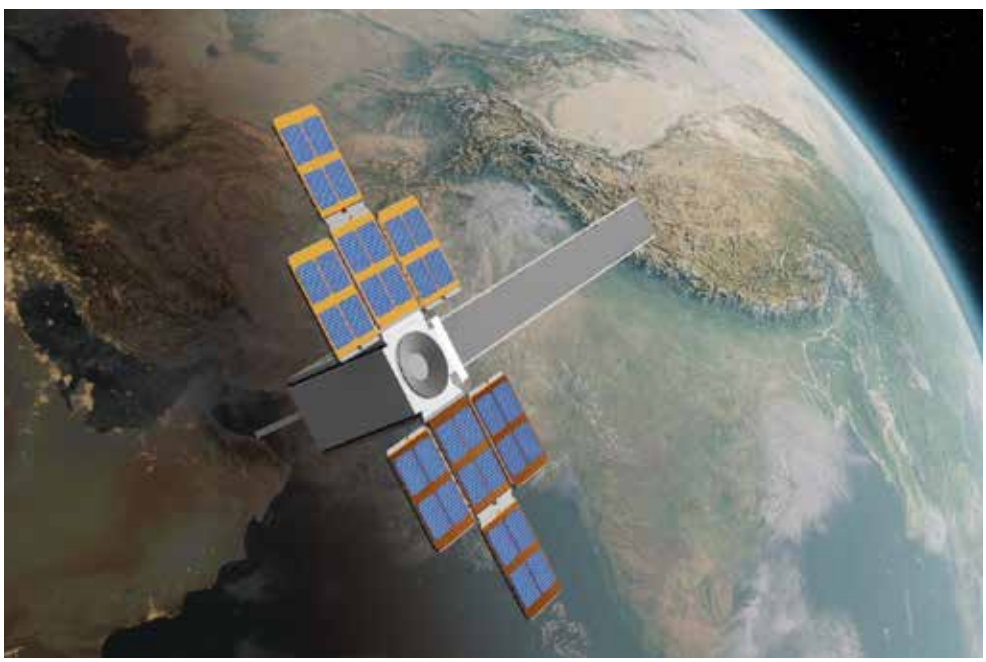
**Can you quantify how much shipping is 'lying'? And will Indian enforcement agencies be customers?**

"With enough data, yes, we will be able to. Groups like Global Fishing Watch have documented AIS gaps and dark-fleet activity for years using exactly this SAR-versus-AIS comparison. Once we have real operational data, we'd be glad to come back with PierSight-specific figures."

"On prospective customers: PierSight is already in advanced conversations with Indian maritime security and enforcement stakeholders about how Varuna data could support domestic requirements."

**The takeaway**

PierSight separates the sensor from the screen. India can own the satellite and the data while choosing, case by case, whose platform delivers it. That distinction matters for sovereignty: a domestic data source keeps India out of the "space divide" even if the user interface is foreign.



**Editor's note:**

Norway's leverage comes from outside the EU deal. Norway is a member of EFTA, whose trade pact with India (TEPA) entered into force on 1 October 2025 with a goal of $ 100 billion in investment in India over 15 years. The separate India–EU FTA was concluded on 27th January 2026.

# EFFICIENCY FIRST: WÄRTSILÄ'S CASE FOR SMARTER PROPULSION

**Bernd Bertram, Vice President, Propulsion at Wärtsilä**, on Gate Rudder's fuel savings, hybrid propulsion and why integrated vessel design will define the next five years.

**Wärtsilä has posted an all-time-high order intake with record marine orders. How much of that surge is propulsion-specific, and what's driving it: newbuild fleet renewal, retrofits, or both?**

The marine industry is going through a significant period of transition and we're seeing growing interest in propulsion as part of a broader efficiency and decarbonisation strategy. The conversation has moved beyond simply replacing equipment. Owners are increasingly asking how they can improve the efficiency of the entire vessel and reduce energy demand while maintaining flexibility for the future.

Efficiency is no longer a nice-to-have. Rising fuel costs, tightening regulations and uncertainty around future fuel pathways are exactly the reasons shipowners are looking for solutions that deliver immediate operational benefits while keeping long-term flexibility on the fuel question.

Geopolitical disruption plays a role as well. Rerouting and longer voyage distances are supporting vessel utilisation, which in turn reinforces the case for propulsion efficiency for fleets.

There is a strong role for both newbuilds and retrofits to play. On the newbuild side, meeting increasingly stringent Energy Efficiency Design Index (EEDI) baselines often requires measures such as de-rating main engine power or adopting approved energy saving devices. Gate Rudder would help shipowners to achieve their target EEDI rating. Newbuild projects create opportunities to optimise the whole vessel from day one, while the existing fleet represents a significant opportunity to improve efficiency, reduce fuel consumption and lower emissions through upgrades and optimisation. For retrofits, owners are protecting their vessels' commercial position as much as their compliance status. For example, with the tightening of IMO's Carbon Intensity Indicator, CII requirements are being included in charter contracts, which means a D- or E-rated vessel can be excluded from cargo programmes altogether. Retrofits or upgrades give owners a way to protect a vessel's rating and marketability now, without needing to commit to a specific fuel pathway – this is the kind of flexibility shipowners are looking for.



**The greatest risk may not be choosing the wrong fuel pathway, but delaying efficiency improvements that can deliver value under almost every future scenario.**

**–Bernd Bertram**
*Vice President, Propulsion, Wärtsilä*

**At your stand you're demonstrating the Gate Rudder™ simulator alongside CPP controls. What's the real-world efficiency delta owners are seeing from Gate Rudder versus conventional rudder-propeller setups, and what vessel segments suit it best?**

What has been particularly encouraging is that across full-scale applications we have seen a consistent trend of up to 20% fuel savings with Gate Rudder compared with representative conventional rudder arrangements.

The concept is built around a relatively simple idea. Traditionally, the rudder has been viewed as a steering device. We see it as part of the overall propulsion system. Every time a vessel makes a course correction there are hydrodynamic losses associated with the interaction between the propeller and rudder. Gate Rudder is designed to reduce those losses while improving manoeuvrability.

The distinction matters because vessels do not spend their lives sailing in a perfectly straight line. They are constantly making small course corrections, and those operational realities need to be factored into any assessment of propulsion efficiency. We have carried out full-scale CFD studies on Japanese sister vessels – one fitted with a conventional flap rudder and one with Gate Rudder. Even at the relatively small steering angles associated with normal seakeeping, we see significant differences in hydrodynamic behaviour. Beyond straight-line efficiency, we also see advantages in manoeuvrability, course keeping and maintaining speed during turns.

Gate Rudder is particularly attractive for single-screw merchant vessels where efficiency is a key priority and where propulsion, steering and hull design can be optimised together. It can technically be fitted to existing vessels, though the full performance and economic benefits are realised when it is built into the vessel design from the outset since it relies on

the hull form, propulsion layout, and steering system being optimised together.

### Hybrid and full-electric propulsion keep expanding beyond ferries and short-sea into deep-sea segments. Where is Wärtsilä seeing the real commercial tipping point for electrification on larger tonnage?

I don't think there is a single tipping point because the economics depend heavily on vessel type, route, operating profile and access to charging infrastructure. Sometimes the industry talks about electrification as a destination. In reality, it's a tool. The real question is not whether a vessel should be electric, but which combination of technologies delivers the best economic and operational outcome.

We already see strong opportunities for hybridisation. Wärtsilä will be supplying a hybrid propulsion package for Vertom Group's four 10,700 DWT geared tween decker vessels. The package is designed to optimise vessel propulsion efficiency while enabling sailing modes on batteries without using combustion power. Similarly, Wärtsilä has also supplied a hybrid electric propulsion system for Canada Steam Ship Lines Group's 11,000 DWT limestone carrier MV Yampu – the world's first battery-hybrid self-unloading bulk carrier. Batteries can help optimise engine loading, support peak demand and improve overall efficiency. Full electrification – whilst ideal for short-sea routes and ferries – can be more challenging as vessel size, range and energy requirements increase.

Looking ahead, I expect batteries, alternative fuels and highly efficient propulsion systems to work together rather than compete. The objective is to create the most efficient solution for the way a vessel actually operates.

### On fuel flexibility (methanol, ammonia, LNG dual-fuel) how is the propulsion side of the business, versus engines, adapting shaft lines, gearboxes and controls to accommodate multi-fuel operational profiles?

From the propulsion side, the bigger issue is flexibility rather than any individual fuel. Whether a vessel runs on methanol, ammonia or LNG dual-fuel, the propulsion system needs to evolve alongside the changing fuel landscape. Shipowners are making decisions today about assets that will operate for decades, while the future fuel mix remains uncertain – evident in the vessel orderbook itself. According to DNV, LNG propulsion accounted for the largest share of orders, with 188 contracts representing 68% of total alternative-fuelled newbuild orders in 2025 and 31% of overall gross tonnage. Methanol-fuelled newbuild secured 6% share by tonnage with ammonia maintaining a niche presence. The IMO's own vote on its Net-Zero framework – meant to chart a path to its 2050 net-zero target – was adjourned to October 2026, adding regulatory uncertainty in addition to the market's own indecision. This combination is why adaptability matters more than betting on any single fuel.
Despite whatever fuel ultimately gains market share, efficiency remains the constant. Every percentage point of efficiency reduces fuel consumption, operating costs and environmental impact. It also reduces the amount of fuel infrastructure the industry ultimately requires.

That's why we increasingly focus on optimising the complete propulsion system, including the interaction between the propeller, rudder, controls, engine and hull, rather than looking at individual components in isolation. The greatest risk may not be choosing the wrong fuel pathway, but delaying efficiency improvements that can deliver value under almost every future scenario. The objective is to improve performance today while maintaining the flexibility to adapt as fuel markets, infrastructure and regulations continue to evolve.

**SHIPOWNERS ARE MAKING DECISIONS TODAY ABOUT ASSETS THAT WILL OPERATE FOR DECADES, WHILE THE FUTURE FUEL MIX REMAINS UNCERTAIN – EVIDENT IN THE VESSEL ORDERBOOK ITSELF. ACCORDING TO DNV, LNG PROPULSION ACCOUNTED FOR THE LARGEST SHARE OF ORDERS**

### Wärtsilä has flagged lifecycle optimisation as a top 2026 trend. What does that mean concretely for propulsion customers: performance-based service contracts, digital twins, predictive maintenance?

Lifecycle optimisation means looking beyond the point at which equipment is delivered. A propulsion system creates value over decades, not on the day it is installed. Performance-based service contracts shift the commercial relationship from a one-off sale to an ongoing partnership anchored in mutually-beneficial outcomes. In January this year, we signed a 10-year Lifecycle Agreement with MOL Global Ship Management covering the engine and propulsion equipment on a new LNG-fuelled vessel – including Dynamic Maintenance Planning, 24/7 remote operational support and extended service intervals. Our aim here is to support the long-term reliability and reduced operating costs of the vessel rather than on a transactional parts-replacement model. Digital twins let us model how a specific vessel or fleet behaves in reality, and use that knowledge to prioritise where investment would have the most impact. For instance, Wärtsilä built a digital twin of Carnival Corporation's cruise ship Regal Princess using three years of operational, itinerary, and sensor data to simulate energy-saving technologies and guide fleet-wide retrofitting priorities. Predictive maintenance tools, like Wärtsilä Expert Insight and Dynamic Maintenance Planning, use operational data to spot issues and optimise performance before they become costly problems, rather than waiting for scheduled intervals or failures. That starts with collecting operational data and using those insights to optimise maintenance, performance and fuel consumption. It also reinforces the importance of designing the vessel as an integrated system.

Small gains across the hull, propeller, rudder and control systems can translate into significant long-term operational benefits. The industry has traditionally focused on optimising individual components. Increasingly, the opportunity lies in optimising performance throughout the lifecycle of the entire vessel.

### Retrofit versus newbuild: Where is Wärtsilä seeing more propulsion-related demand right now, and does that balance shift as the existing fleet ages toward 2030 emissions milestones?



We need both, but newbuild is where we are seeing greater demand right now. Newbuild activity has increased significantly – Wärtsilä recorded 549 vessel orders in Q1 2026, up from 235 in the same period last year. Newbuild projects provide the greatest opportunity to optimise the vessel from the outset. Designers can consider the hull, propulsion, steering and energy systems together to maximise efficiency.

At the same time, the existing fleet represents one of the biggest opportunities available to industry today. These vessels will remain in operation for many years, and improving their efficiency can deliver immediate reductions in fuel consumption and emissions. In many cases, improving the efficiency of vessels already in operation can deliver immediate reductions in fuel consumption and emissions while extending their useful commercial life – global shipyard capacity can only renew roughly 2% to 3% of the global fleet each year (between 1,500 and 2,100 vessels per year across all sectors). On whether the balance shifts towards 2030 – it is likely to, and mainly for regulatory reasons. As the industry awaits the IMO's vote on its Net-Zero framework, there is growing room for a fragmented landscape of regional carbon pricing mechanisms. That fragmentation, together with tightening compliance milestones, means owners will keep evaluating both retrofit and newbuild investment. The right choice depends on the age, operating profile and long-term strategy of each vessel.

**If you had to bet on which propulsion technology will be the "must-have" standard five years from now — batteries, wind-assist, alternative fuel engines, or something less talked-about — where would you put your money?**

I wouldn't bet on a single technology. The global fleet is simply too diverse for there to be one universal answer – different vessel types, operating profiles and trade routes will require different solutions. If I had to put money on a trend, it would be integration. The most successful vessels five years from now would not be defined by any one technology, but how intelligently they combine batteries, wind-assisted propulsion, alternative fuels, digital optimisation and propulsion design. None of this works in isolation. Owners will need to maximise transport work from every unit of energy while retaining the ability to adapt as regulations and fuel pathways evolve. That is where I see the industry heading.

**What's the one misconception shipowners still have about propulsion decarbonisation that you'd like to correct on record?**

Perhaps the biggest misconception is that decarbonisation is primarily a question of choosing the right fuel. Fuel is of course a vital part of the solution, but it is only one part. Before we think about what energy source powers the vessel, we should ask how efficiently that energy is being used.

Improving efficiency reduces fuel consumption, operating costs and emissions regardless of which fuel is chosen. It also helps owners manage the financial impact of sustainable fuels, many of which are already significantly more expensive than today's conventional fuels, and in limited supply.

Bio-methanol, for example, averaged around $ 2,500 per tonne MGOe in 2025 – roughly three times the cost of marine gas oil – while global production stands at only 2.2 million tonnes, falling short of potential demand that could reach 60 million tonnes by 2040. That means looking at the vessel as a complete system, including the engine, hull, propeller, rudder, controls and operational practices.



**HITESH VYAS**
Wirana

# GREEN RECYCLING COMES BEFORE COMMERCIAL GOALS

**Hitesh Vyas, Vice President and Green Recycling Coordinator** at **Wirana**, explains how the world's oldest cash buyer of ships keeps end-of-life vessels compliant with the Hong Kong Convention, and why India is leading the shift to certified yards.

**Wirana describes itself as the world's oldest and largest cash buyers of ships, with more than 40 years of experience and over 2,800 vessels handled. How has the company's business model evolved from conventional ship demolition to responsible and green ship recycling?**

Wirana is the oldest and one of the largest cash buyers in the world, and it has always been a responsible cash buyer. That means Wirana is mindful of the recycling tonnage it buys and, at the same time, of the ship recycling facilities it sells to. Wirana makes sure that each facility has the capability to recycle the ship properly and in compliance with the applicable regulations.

Wirana has also always honoured the Memorandum of Agreement (MOA) made with sellers, on price as well as on every clause, which is another quality of a responsible cash buyer.
With the passage of time, the regulatory requirements for ship recycling have expanded to ensure that ships are recycled in a safe and environmentally sound manner. We have a global, ship-recycling-specific regulation, the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (HKC), which came into force on 26 June 2025. We also have a regional regulation, the EU Ship Recycling Regulation (EU SRR), which came into full force on 31 December 2020. These, along with other applicable regulations such as the Basel Ban, require cash buyers to ensure they comply with all applicable rules. The fact that some cash buyers do not fully deliver on all of these parameters is what differentiates responsible cash buyers, such as Wirana and a few others, from the rest.

**Could you explain the typical process once Wirana decides to purchase a vessel, from valuation and contract signing to delivery at the recycling yard and completion of recycling?**

When a vessel is offered for recycling, the shipowner shares the vessel's specifications. On that basis, and keeping market conditions in view, a cash buyer submits an offer for the recycling candidate. Once negotiations conclude and a deal is struck, there is a recap of the sale price and terms. A draft MOA is then exchanged between buyer and seller and, once all terms are confirmed, both parties sign it. The vessel can be bought on a delivered basis, where the shipowner delivers it to the recycling destination, or on an "as is" basis, where the shipowner hands it over at another location. In an "as is" purchase, the cash buyer takes over the vessel and registers it in its own name with a flag and class. The crew then sails the ship to the recycling destination, customs clearance is arranged and, once all formalities are completed, the vessel is delivered to the ship recycling facility. Where the seller delivers at the recycling destination, the cash buyer takes over the vessel at the outer anchorage and arranges its onward delivery. Payments are made to the seller as per the MOA.

Once the ship is at the recycling facility, the cash buyer oversees the recycling to make sure it is carried out as per the MOA and in compliance with local and international regulations. Periodic reports are issued throughout the process, followed by a completion report at the end. These reports are shared with the sellers, and any clarifications they need are provided.

**How does Wirana balance the commercial requirements of shipowners, such as price and delivery timelines, with the higher costs and operational demands of green recycling?**

What is very important for Wirana as a cash buyer is to understand the requirements of the sellers as well as the regulatory requirements for ship recycling, and to make sure the ship recycling facility is equally advised of its responsibilities under the MOA and under



local and international regulations. With this understanding in place, expected costs are properly worked out. The offer made to shipowners is calculated on the expected recycling costs, an understanding of the local and international steel markets, and delivery costs. It is important to note that at no point do commercial goals take precedence over the green recycling requirements. Any additional costs of meeting those requirements are taken into account and the offer for the ship is made accordingly. This ensures that both the commercial and the green recycling requirements are properly met. Given the limited supply of recycling candidates, there are cases where the green recycling requirements are met even when the buyer is making a loss.

**AT NO POINT DO COMMERCIAL GOALS TAKE PRECEDENCE OVER THE GREEN RECYCLING REQUIREMENTS. THERE ARE CASES WHERE THOSE REQUIREMENTS ARE MET EVEN WHEN THE BUYER IS MAKING A LOSS**

**What specific role does Wirana's in-house green team play in ensuring that a vessel is recycled in line with the Hong Kong Convention, the EU Ship Recycling Regulation and individual shipowner standards?**

The first step is to understand which regulations apply to the case in hand. For example, if the vessel is EU-flagged, the EU SRR requirements must be complied with. If the vessel is not EU-flagged and is not in EU waters, it can be recycled as per the HKC. Irrespective of the applicable regulations, Wirana's green team makes sure that the documentation required by the flag state and the relevant recycling authorities is conveyed to both the shipowner and the ship recycling facility. If either is unclear about the process, the green team guides them step by

**About Hitesh Vyas**
is Vice President and Green Recycling Coordinator at Wirana Shipping. He also chairs a working group within the Alliance that supports consistent implementation of the Hong Kong Convention. Wirana has handled more than 2,800 vessels totalling over 88 million deadweight tonnes. His areas of focus include responsible recycling capacity, yard selection, worker protection, and hazardous materials management.

step to make compliance smooth and easy. The team can also discuss the requirements and responsibilities placed on shipowners and ship recycling facilities so that both can deliver as required, and it can supervise the complete recycling process on the shipowner's behalf.

**How does Wirana support shipowners in preparing and verifying the Inventory of Hazardous Materials before a vessel enters the recycling process?**

Wirana understands the importance of the Inventory of Hazardous Materials (IHM) and has worked with several responsible service providers that prepare it. Depending on the ship type and the vessel's location, Wirana can guide shipowners to appropriate service providers. Once the IHM has been prepared, Wirana's green team makes sure it meets the requirements specified in the HKC or EU SRR.

**Could you describe how Wirana monitors the preparation and implementation of a Ship Recycling Plan, including the identification, storage and safe disposal of hazardous materials?**

The Ship Recycling Plan (SRP) is prepared by the ship recycling facility, keeping in view its approved Ship Recycling Facility Plan (SRFP), the ship type and local and international requirements, including those for processing hazardous materials.

Wirana makes sure the facility receives all the documents needed to prepare the SRP. Once it is ready, Wirana's green team reviews it, discusses with the facility any points that are not in line with the SRFP or the ship type, and suggests corrections where necessary. Once the green team is satisfied, the SRP is given to the shipowner.

During recycling, the green team verifies the work against the SRP using periodic reports and physical visits to the facility. With each periodic report, Wirana checks an account of the hazardous materials identified, stored and disposed of. At the end of recycling, the hazardous materials listed in the IHM are cross-checked against those dispatched. The green team also visits the facility to see the handling of hazardous materials first-hand.

**INDIA HAS THE HIGHEST NUMBER OF COMPLIANT SHIP RECYCLING FACILITIES TODAY, WITH MORE THAN 110 HKC-CERTIFIED FACILITIES**

**Wirana has stated that it encourages yards to separate primary recycling from secondary cutting and to use concretised secondary-cutting areas. How widely are these practices being adopted, and what measurable environmental benefits have they delivered?**

Since the HKC came into force, it is mandatory for all oily blocks to be cleaned on impermeable flooring, with oily water collected through drainage lines into a tank, from where it is handed to a government-authorised agency for safe disposal. This is no longer optional, as it was before the HKC. Only yards that meet the minimum HKC requirements are now approved to recycle ships, which is why the number of ship recycling facilities in Bangladesh and Pakistan has reduced for the time being.

Because blocks are first cleaned and oily blocks are cut on concretised floors, there is a clear reduction in soil and water contamination, as evidenced by soil and water testing reports. Many facilities in India and Bangladesh now have entirely impermeable flooring, so that not a single operation is carried out in direct contact with the soil. Many also use heavy-duty cranes to move blocks from the ship directly onto impermeable flooring. All these developments ensure that ship recycling practices are environmentally sound.

**How does Wirana verify that a yard has actually followed the agreed recycling procedures after the vessel has been delivered? Do you use independent audits, classification societies, third-party experts, progress reports or on-site supervision?**

We understand the requirements of the MOA with shipowners, as well as the minimum requirements for recycling a ship under prevailing national and international regulations. We ensure recycling is carried out accordingly through a combination of supervision, either by our own green team or by independent supervision companies working on Wirana's behalf. We also make sure ship recycling facilities provide periodic reports, which are very useful for ensuring that HSE parameters are well under control. These reports include photographs of the recycling activities, which are used to cross-check the proper use of PPE and confirm that the right processes are being followed. Wirana's team promptly reaches out to the facility if it finds that something is not being done as required.

**How do you assess the current global ship-recycling market across India, Bangladesh, Pakistan and other recycling destinations, particularly in terms of capacity, pricing, regulation and the availability of compliant yards?**

With very few ships coming out for recycling, there are more than enough facilities for the limited number of recycling candidates. Because of this limited supply, sellers are obtaining very high prices, and it is a sellers' market. India has the highest number of compliant ship recycling facilities today, with more than 110 HKC-certified facilities. Bangladesh has about 31 and Pakistan about five.

However, things could change once the supply of recycling candidates increases, as has been expected for some time now. When this happens, there will be a period of capacity constraints for a few months, after which more facilities will become available again. As would be expected, prices offered for recycling candidates will fall with increased supply, and could fall substantially if supply is as high as anticipated.



# India's Coal & Coke Sector

Maritime Gateway Research Bureau

India's coal and coke markets navigated a turbulent August 2026, marked by a monsoon-driven dip in domestic production, a sharp surge in seaborne thermal coal imports, and continued momentum in the country's coking coal and pig iron trade. The following analysis consolidates production, dispatch, port traffic, and policy data for the period, covering August 2026 figures alongside the cumulative April–August 2026 trend.

## Domestic Coal Production Slips on Monsoon Disruption

India's total coal production fell to 66.87 MT in August 2026, down 3.76% y-o-y from 69.48 MT. The decline was led by Coal India Limited (CIL), the country's dominant producer, whose output dropped 5.72% to 47.52 MT, largely attributed to heavy monsoon rains disrupting mining operations. Singareni Collieries Company Limited (SCCL), by contrast, posted healthy growth of 6.94% to 4.28 MT, while captive and other miners held roughly flat at 15.07 MT. Cumulatively, total production for April–August 2026 stood at 369.17 MT, a 3.19% decline from 381.35 MT a year earlier. CIL's cumulative output fell 4.52% to 267.50 MT, and SCCL's fell more sharply by 12.45% to 21.18 MT.

The one bright spot was the captive/others segment, up 4.53% to 80.49 MT, underscoring the growing contribution of private and commercial mining blocks to national supply. Coking coal production told a more mixed story. CIL's coking coal output jumped sharply in August, up 17.65% y-o-y to 3.78 MT, even as the cumulative April–August figure slipped 2.79% to 18.98 MT.

## Dispatch Growth Outpaces Production

Despite softer output, coal dispatch to consuming sectors rose robustly by 5.47 % y-o-y to 81.87 MT in August, and 5.96% to 437.30 MT cumulatively for April–August. This divergence between falling production and rising dispatch was made possible by a drawdown of pithead stockpiles.

The power sector remained the dominant consumer, receiving 65.63 MT in August (+3.73% y-o-y) and 346.73 MT cumulatively (+3.98% y-o-y). Captive power plants (CPP) bucked the trend with a steep 26.23% y-o-y decline in August to 4.53 MT, and a 20.57% cumulative drop to 23.82 MT. Industrial sectors tied to steel and metallurgy showed the strongest growth: dispatch to steel plants jumped 49.68% in August to 1.64 MT (up 23.52% cumulatively to 7.19 MT), while sponge iron dispatch surged 53.89% to 0.98 MT in August and 44.68% cumulatively to 5.25 MT. Cement dispatch grew a more modest 16.79% in August, and the "Others" category rose 42.47% to 8.45 MT.

### Port Traffic: Mundra and Paradip Lead Coal Imports

Mundra port retained its position as India's busiest coal gateway during April–August 2026, handling 11.07 MMT, followed by Paradip at 8.92 MMT and Krishnapatnam at 8.10 MMT though Krishnapatnam's volume actually declined from 9.71 MMT a year earlier. Dhamra port recorded the most dramatic swing, surging from just 0.36 MMT in the prior-year period to 6.22 MMT. On the buyer side, JSW Steel Ltd. was India's largest coal importer during April–August 2026 at 11.28 MMT, narrowly ahead of Adani Power Ltd. at 10.60 MMT. Steel Authority of India Ltd. 6.95 MMT and Adani Enterprises Ltd. 6.68 MMT followed, with Tata Steel Ltd. importing 6.44 MMT.

By origin, Indonesia remained India's single largest coal supplier by a wide margin, shipping 29.98 MMT during April–August 2026 nearly double the next largest source, Australia, at 15.21 MMT. South Africa 11.89 MMT and Russia 10.91 MMT followed, with the United States contributing 5.17 MMT. Smaller volumes came from Mozambique (2.92 MMT), Singapore (2.28 MMT), Malaysia (1.07 MMT), China (0.54 MMT), and Egypt (0.49 MMT). Coke imports followed a similar pattern on a smaller scale, totaling 5.44 MMT for the five-month period. Visakhapatnam port handled the largest share at 1.29 MMT, followed by Bedi port at 0.83 MMT nearly doubling from 0.45 MMT a year earlier. Kandla, despite ranking among the top coke ports, saw volumes fall sharply from 1.61 MMT to 0.57 MMT. By source country, the United States led coke supply at 1.39 MMT, ahead of Indonesia at 0.92 MMT, with Colombia, China, Brazil, Saudi Arabia, and South Africa each contributing smaller but meaningful volumes.

### Thermal Coal: Power Sector Imports Surge Amid Monsoon Shortfall

The power sector emerged as the epicentre of import growth in August, with utilities' coal imports jumping 85.6% y-o-y to 5.52 MT, a 15-month high not seen since May 2025. Indonesia supplied roughly 80% (4.2 MT) of this power-sector import volume. The surge was driven by a supply-demand mismatch: heatwave conditions, reduced rainfall curbing hydropower generation, and insufficient battery storage to back up solar capacity all pushed up cooling and power demand. Domestic coal deliveries to the power sector grew by only 2.3 MT, far short of the 10 MT increase in consumption, forcing utilities to turn to costlier seaborne coal. This strain showed up in inventory data: nearly one-third of India's coal-fired power plants reported critically low fuel stocks in August. Nationally, coal reserves stood at 123.7 MT — sufficient for roughly 51 days of consumption at a burn rate of 2.4 MT per day with 23.7 MT held at power plant yards and a substantial 100 MT still in transit.

**Total coal demand in 2026 is projected to grow 4.2% to 1,353 MT, rebounding from a 1% decline in 2025, driven by El Nino–linked cooling demand, weaker hydropower output, and industrial growth across steel, pig iron, and cement. Domestic output is forecast to reach a record 1,095 MT, while thermal coal imports are projected to decline to around 160 MT as domestic substitution strengthens. Coking coal demand, by contrast, is expected to keep India as a global demand leader, propelled by blast furnace steel expansion and pig iron production.**

### Coking Coal and Met Coke: Steel Sector Demand Accelerates

India's steel sector continued to drive record coking coal and metallurgical coke (met coke) imports. Met coke imports are projected to hit a record 6 million tonnes in FY26–27, up 32% y-o-y, even after a five-year anti-dumping duty was imposed in July. Indonesia's role as a met coke supplier expanded dramatically, with imports up 165% y-o-y to 2.1 MT so far, this fiscal year. A key driver behind this import surge is a duty-arbitrage dynamic: domestic coke production grew only 6%, falling short of pig iron demand, while pig iron manufacturers who convert imported met coke into pig iron for export receive an exemption from import duties. This has created a strong incentive for import-led pig iron production. Compounding the opportunity, U.S. demand for Indian pig iron is expected to double relative to 2025 levels, owing to a $50-per-ton price advantage over Ukrainian suppliers. Input costs have climbed steadily met coke prices rose 24% y-o-y to ₹35,850 ($375.63) per ton in August, tracking a rise in global hard coking coal prices that touched $245 per ton in July.

### Supply-Side Response and Policy Developments

On the domestic supply side, CIL's August output fell 5.7% to 47.5 MT due to monsoon disruption, with cumulative April–August output down 4.5% to 267.5 MT. However, offtake rose 5.5% to 60.6 MT, supported by supplies to the power sector (+4.5% to 48.46 MT) and the non-regulated sector (+9.6% to 12.12 MT). CIL drew down roughly 55 MT of pithead stocks over the first five months of FY26 to meet demand, leaving 76 MT in reserve for a post-monsoon production ramp-up. Private and captive mining output reached 210.46 MT in FY26, up 10.22% y-o-y, with new Mine Opening Permissions adding over 86 MT of annual capacity.

On policy, the Ministry of Coal launched its 16th commercial coal auction round, offering 25 blocks across Odisha, Maharashtra, Jharkhand, and Chhattisgarh. The government also opened Phase 2 of its ₹37,500-crore Coal Gasification Scheme, targeting 100 MT of coal gasification by 2030 to reduce reliance on imported LNG, urea, ammonia, and methanol imports currently valued at ₹2.77 lakh crore annually. Phase 1 attracted proposals from Adani Enterprises, Talcher Fertilisers, NTPC, Gallantt Ispat, and Shyam Sel & Power. In a related move, CIL signed an MoU with ArcelorMittal Nippon Steel to evaluate a coal gasification and carbon capture (CCUS) facility near AMNS's Paradip pellet plant, aimed at displacing imported natural gas and coking coal.

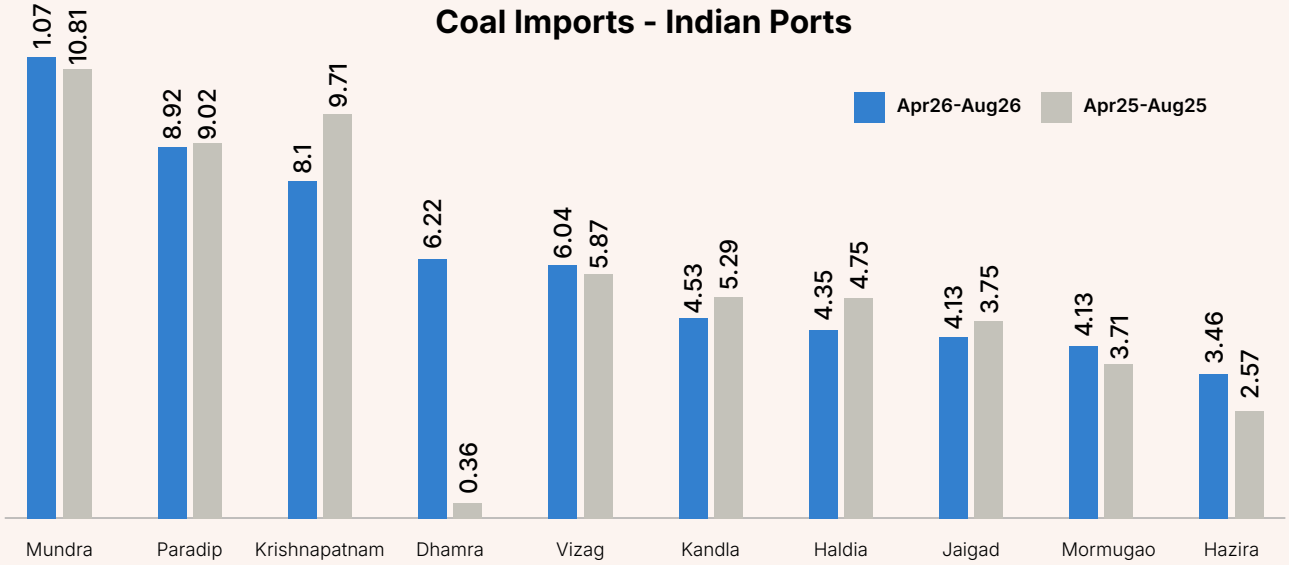
### Outlook for 2026

Total coal demand in 2026 is projected to grow 4.2% to 1,353 MT, rebounding from a 1% decline in 2025, driven by El Nino-linked cooling demand, weaker hydropower output, and industrial growth across steel, pig iron, and cement. Domestic output is forecast to reach a record 1,095 MT, while thermal coal imports are projected to decline to around 160 MT as domestic substitution strengthens. Coking coal demand, by contrast, is expected to keep India as a global demand leader, propelled by blast furnace steel expansion and pig iron production.

# Coal and Coke Imports

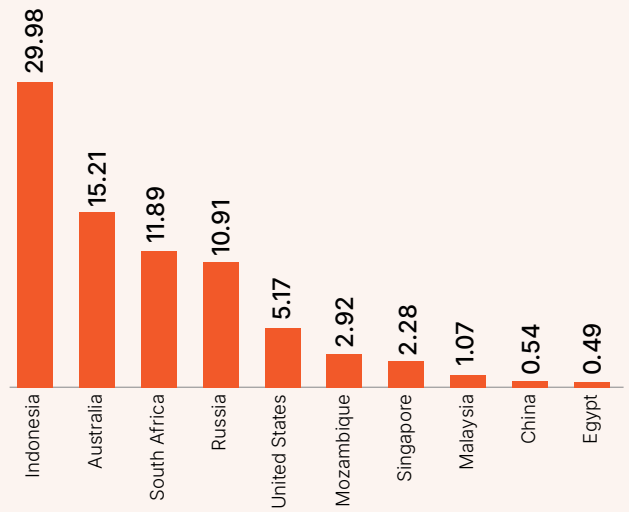
(Qty in MMT)

## Coal Imports - Indian Ports



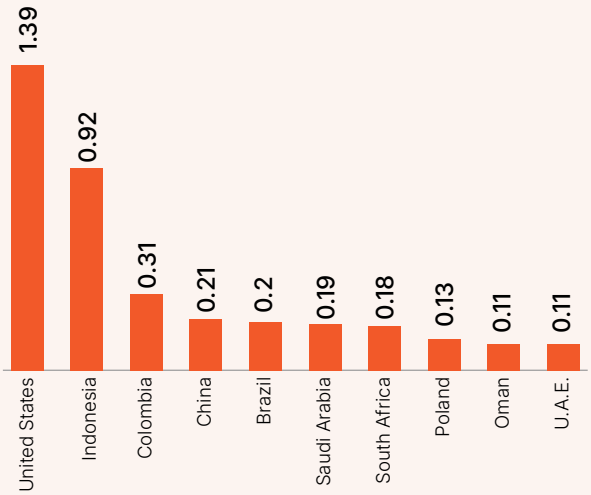

Mundra tops coal port imports at 11.07 MMT

## Coal Imports by Country




Indonesia supplies 29.98 MMT, over 40% of coal imports

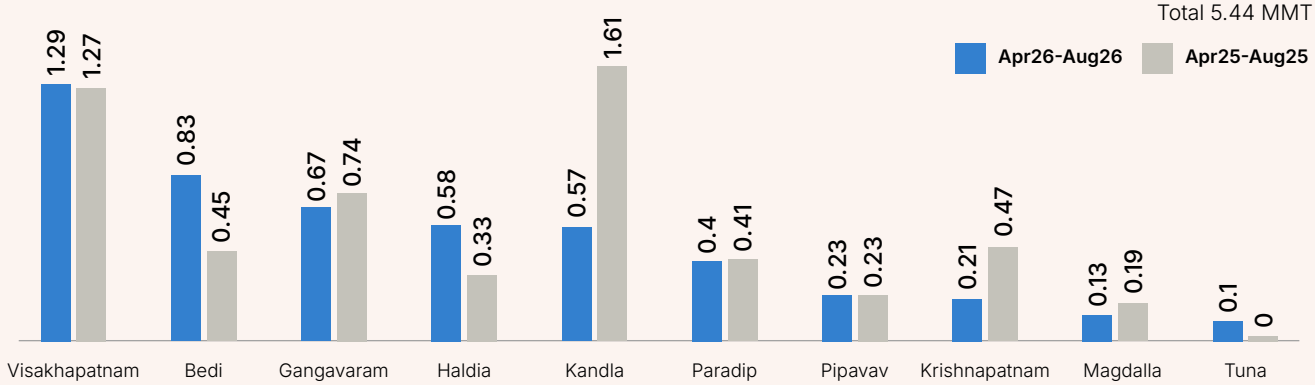
## Coke Imports by Country




U.S. is the top coke source at 1.39 MMT

## Coke Imports - Indian Ports

Total 5.44 MMT




Visakhapatnam leads coke imports at 1.29 MMT

*Source: Ministry of coal*

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