

THE GREEN TUGS PUSH

How a mandate to decarbonise
harbour towage is creating an
industry around it





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Small Vessels, a Big Signal

For years, maritime decarbonisation in India was mostly discussed in conference halls. The Green Tug Transition Programme has changed that. Announced in May 2023 and backed by a standard operating procedure in August 2024, the GTTP now shows up as steel, batteries and signed charters. That is why it has caught the attention of stakeholders at home and abroad.

The momentum is clear. At Mandovi Drydocks in Goa, steel was cut in December 2025 for Deendayal Port's 60-tonne battery-electric tug. At Cochin Shipyard, two tugs for Polestar Maritime at JNPA are about 70 per cent complete and could enter service by mid-2027, ahead of their contracted delivery. Kandla, JNPA, Visakhapatnam and V.O. Chidambaram have placed work orders, Mumbai has followed, and other ports are at tender or negotiation stage. What began as policy is becoming an order book.

Much of the enthusiasm comes from a smart contracting model. The tenders are structured as 15-year charters awarded through transparent bidding, which places technology risk with operators who finance, build, crew and maintain the vessels. Ports get predictable costs, operators get long-tenure revenue, and shipyards get repeat business. A 2026 DGMA framework puts the addressable fleet at roughly 400 harbour tugs, so every stakeholder can see a market worth investing in.

The global industry has noticed. Svitzer has chosen Cochin Shipyard to build at least four battery-electric TRANSverse tugs for its international fleet, with an option for four more. Kongsberg Maritime, ABB, Robert Allan and Swedish battery specialist Echandia are all working on Indian projects. When a Danish towage major, a Canadian naval architect and leading European technology suppliers want a seat at the table, India is no longer



a follower in green towage. It is becoming a reference market alongside Antwerp-Bruges and Singapore.

The environmental case is just as strong. Polestar estimates that its two JNPA tugs, charged with green power at the port, will eliminate about 1,500 tonnes of fossil fuel use and 1,000 tonnes of carbon emissions every year.

Challenges remain. Battery life, charging discipline, crew readiness and shore infrastructure must all hold up over a 15-year charter. Ports must invest in charging capacity as seriously as they tender for vessels, and the lessons from Kandla and JNPA will shape every project that follows. Still, the direction is set. The humble harbour tug has become the test bed for India's maritime decarbonisation, and the goal of a fully green fleet at major ports by 2040 now looks less like an aspiration and more like a schedule.

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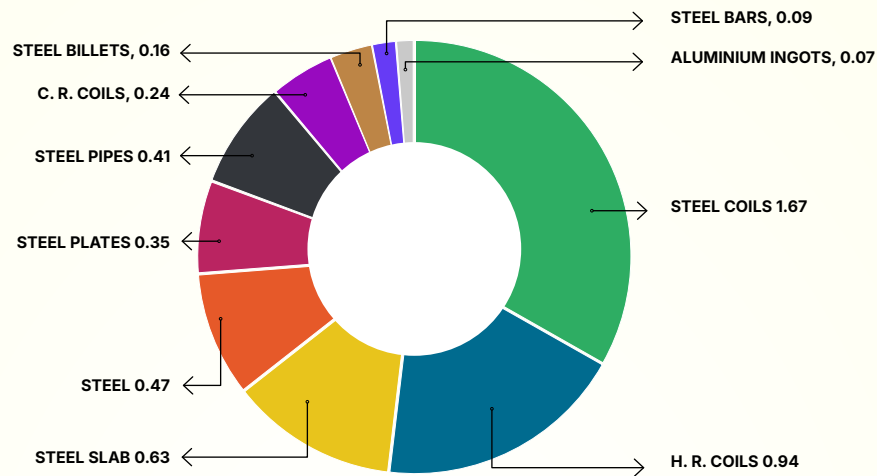


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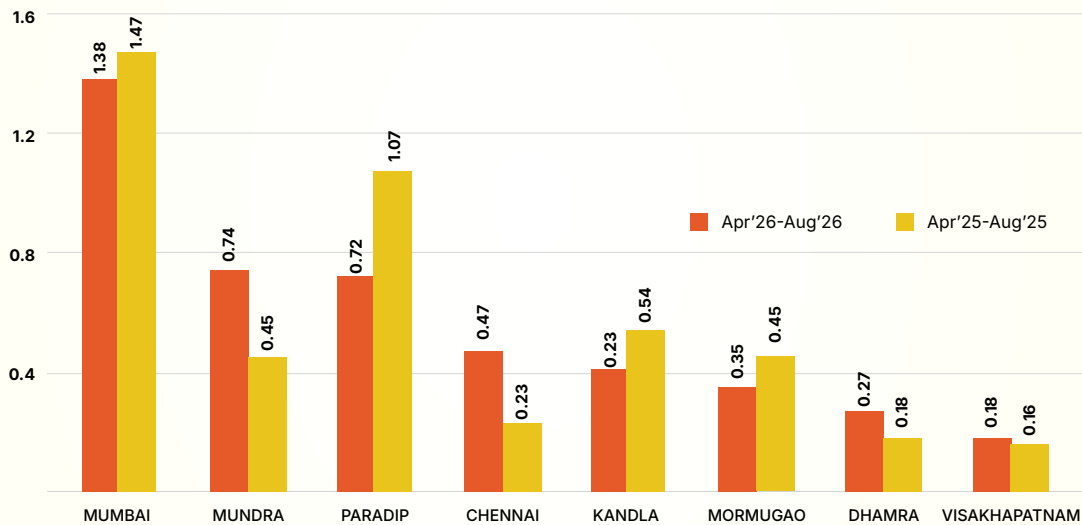
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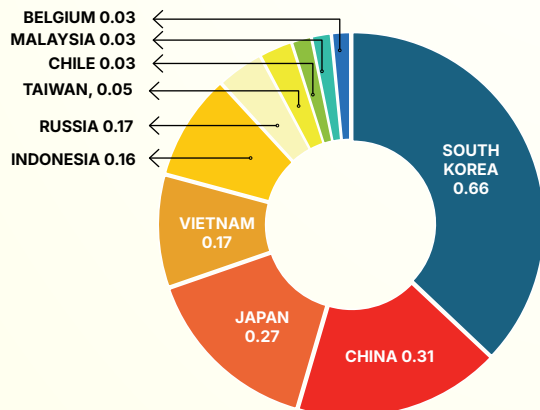
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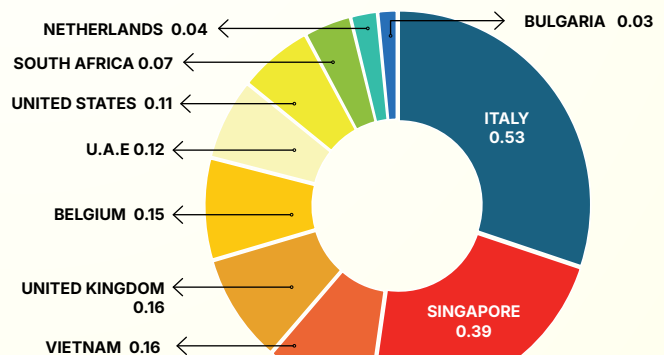
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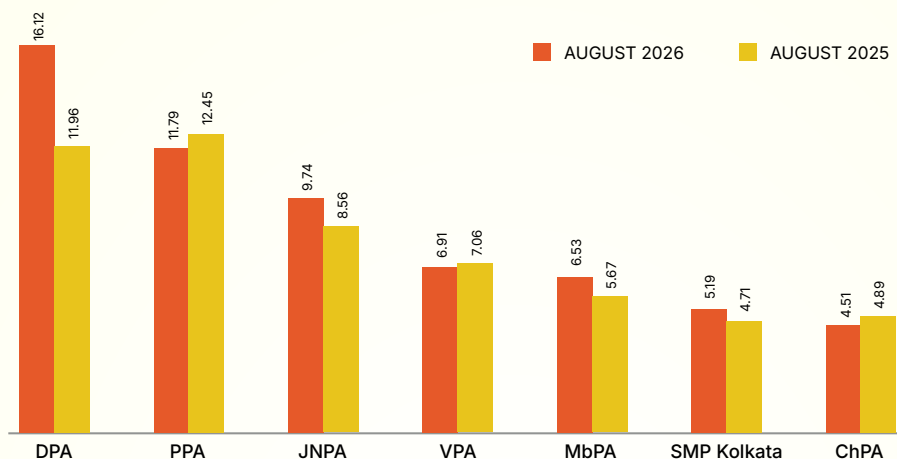
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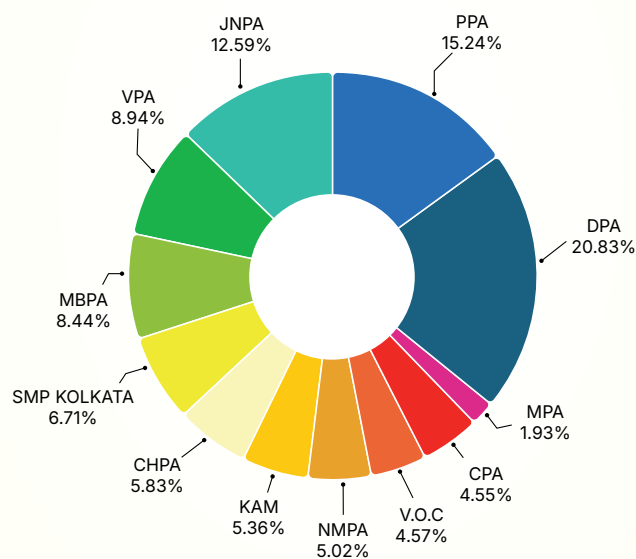
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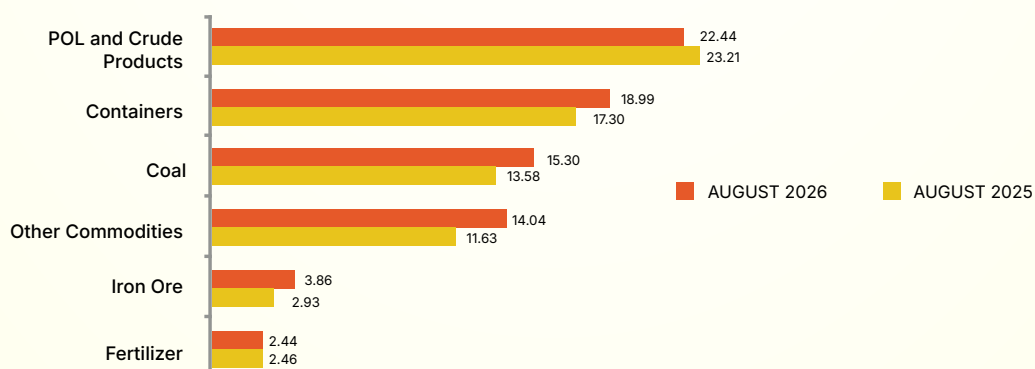
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DEALS *Roundup*

Steel, aluminium, and LNG are the talk of the town in this monthly summary.

Samsung Heavy Industries Secures \$1.2 Billion Order from Oceania-Based Shipowner

Samsung Heavy Industries has secured a \$1.2 billion shipbuilding contract from an undisclosed shipowner based in Oceania, covering six vessels, four large LNG carriers and two crude oil tankers. The deal, announced on September 14, 2026, comprises four 200,000-cubic-metre LNG carriers valued at approximately \$1 billion and two crude oil tankers worth around \$200 million. The LNG carriers are larger than the conventional 174,000-cubic-metre class, enabling greater cargo volumes per voyage and potentially improving transportation efficiency for long-distance LNG movements. The latest contract has pushed Samsung Heavy Industries' 2026 commercial vessel orders to \$7.3 billion for 42 vessels, surpassing its full-year 2025 commercial ship order value of \$7.1 billion. The company has also exceeded its 2026 commercial shipbuilding target of \$5.7 billion by 28%. Including two FLNG projects worth \$4.4 billion, Samsung Heavy's total 2026 orders have reached \$11.7 billion, representing 84% of its annual target. The deal highlights continued demand for LNG and energy-related vessels amid evolving global energy supply chains.

China Gas and Venture Global Sign 20-Year LNG Supply Deal

China Gas Holdings has signed a 20-year LNG supply agreement with U.S.-based Venture Global, marking a significant long-term energy trade deal between China and the United States. Under the agreement, Venture Global will supply 0.5 million tonnes per annum (MTPA) of liquefied natural gas to China Gas from 2030, providing the Chinese company with a long-term source of U.S. LNG. With the latest agreement, Venture Global's total long-term LNG supply commitments to China Gas will rise to 2.5 MTPA. The deal is particularly significant as it represents a resumption of longer-term U.S.-China LNG trade following a period of disruption caused by trade tensions and tariffs, during which China halted U.S. LNG imports in March 2025. China Gas is seeking to strengthen its position in international energy trading while diversifying its LNG supply portfolio.



Drydocks World and Cochin Shipyard Form 50:50 Joint Venture

Drydocks World, a DP World company, and Cochin Shipyard have signed a 50:50 joint venture agreement to operate, consolidate and expand the International Ship Repair Facility (ISRF) in Kochi, marking a major collaboration between UAE and Indian maritime companies. Under the agreement, CSL will transfer the facility to the joint venture through a transaction valued at ₹1,800 crore, while both partners will hold an equal stake in the new entity. The partnership combines CSL's domestic shipbuilding, ship repair and engineering capabilities with Drydocks World's global expertise in high-end vessel repair, maintenance, conversions and offshore engineering. The ISRF, strategically located along major international shipping routes, is expected to gain additional capacity to serve Indian, regional and international vessels. The facility includes a modern ship-lift system and docking infrastructure capable of handling a wide range of vessels. The companies also plan to develop the facility into a broader maritime services hub, creating opportunities in ship repair, fabrication and engineering.





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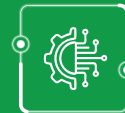
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60% of green renewable energy
share in 2025



Contributes 21% of
India's total customs
revenue

India Secures 6.94 Lakh Tonne Annual Steel Quota Under India-EU FTA

India is set to receive a country-specific tariff-rate quota (TRQ) of 6,94,853 tonnes of steel exports annually under the proposed India-European Union Free Trade Agreement, providing Indian steelmakers with preferential access to the EU market. The quota forms part of a larger 1.64 million-tonne annual country-specific allocation, comprising 6,94,853 tonnes under the FTA component and 9,46,616 tonnes under the existing Most Favoured Nation (MFN) component. The arrangement covers a broad range of steel products, including hot-rolled and cold-rolled sheets, metallic- and organic-coated products, stainless steel, rebars, wire rods, pipes and tubes. The largest allocation is for non-alloy and alloy hot-rolled sheets and strips, at 5,09,605 tonnes, followed by cold-rolled sheets at 2,18,658 tonnes. India currently exports around 4 million tonnes of steel annually to the EU, making the bloc a key overseas market.



APSEZ Wins 30-Year Concession for 18 MMT Dry Bulk Capacity at Paradip Port

Adani Ports and Special Economic Zone (APSEZ) has emerged as the highest bidder and received the Letter of Award for developing and operating two dry bulk berths—CQ-I and CQ-II—at Paradip Port in Odisha. The project will add 18 million metric tonnes (MMT) of mechanised dry bulk handling capacity to APSEZ's portfolio under a 30-year concession, with development planned on a Build-Operate-Transfer basis through the Public-Private Partnership model. The new capacity will increase APSEZ's domestic port portfolio from 653 MMT to 671 MMT, supporting its ambition to achieve 1 billion tonnes of cargo throughput by 2030.

India and MERCOSUR Move to Expand Preferential Trade Agreement

India and the MERCOSUR trade bloc have agreed to expand their existing Preferential Trade Agreement (PTA), opening the way for wider market access and deeper economic cooperation between India and South America. The agreement, operational since June 2009, currently provides India with duty concessions on 450 tariff lines, while MERCOSUR offers concessions on 452 product categories. The two sides are now finalising the Terms of Reference (ToR) that will determine the scope and structure of the expanded agreement, with negotiations expected to cover areas of mutual interest and create additional opportunities for businesses. Bilateral trade between India and MERCOSUR reached approximately \$21 billion in 2025, highlighting the growing importance of the relationship. MERCOSUR comprises Argentina, Brazil, Paraguay, Uruguay and Bolivia, giving India access to a major South American market with significant opportunities in sectors including pharmaceuticals, chemicals, machinery, automobiles, agricultural products and engineering goods. The expansion is also part of India's broader strategy to diversify export markets and strengthen trade links amid changing global supply chains and geopolitical uncertainty. The enhanced agreement could increase product coverage, improve tariff preferences and support greater participation of Indian companies in South American markets.

Reliance Explores Aluminium Entry as Adani Plans \$11.5 Billion Odisha Investment

Reliance Industries is reportedly exploring an entry into the aluminium sector, while the Adani Group is preparing a major investment of around \$11.5 billion in Odisha. Reliance is evaluating opportunities linked to aluminium production and associated raw materials, reflecting growing interest among India's largest business groups in the country's metals and mining sector. Meanwhile, the Adani Group is considering a large-scale integrated industrial investment in Odisha, including projects related to bauxite mining, aluminium production, coal gasification and associated infrastructure. The proposed investments could significantly strengthen Odisha's position as a major hub for aluminium and mineral-based industries. The developments also highlight the increasing competition among large Indian conglomerates to secure access to critical mineral resources and build integrated supply chains. With Odisha possessing substantial bauxite and coal reserves, the state is attracting investments aimed at expanding value-added manufacturing, supporting industrial growth and creating new opportunities across mining, logistics, ports and downstream industries.





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DOMAIN KNOWLEDGE OVER DISRUPTION

President Samir J Shah on **ACAAI's** role, the association's agenda, the challenges facing air cargo agents, and why professionals must gear up for the future.

Ramprasad Ravi

The Air Cargo Agents Association of India (ACAAI) has spent more than five decades representing the agents who move cargo onto India's aircraft; the firms that stand between shippers, airlines, customs and the tarmac. Founded in 1971, the association today engages with civil aviation and customs regulators, the ministry of road transport, MSME, the Logistics Sector Skill Council and a growing list of state governments, well beyond its original brief of helping competing agents learn from each other.

Samir J Shah, ACAAI's president, spoke about how that mandate has widened, the infrastructure and implementation gaps still slowing agents down on the ground, the case for air cargo as a serious alternative to sea freight, and why he believes English fluency and hard-won domain knowledge, not technology on its own, will decide who thrives as the industry digitises.

Fifty years of peer support

Q: How has ACAAI's role evolved since its founding?

The association was built on a simple insight from our founders: agents who competed with each other stood to gain more from talking than from staying siloed, because a competitor understands the same operational pain points and often has different solutions to the same problems. That principle extends to how members deal with shippers, consignees, regulators, custodians, airlines and trucking companies, with an open channel allowing agents to flag bad actors and learn from each other's approaches. Over time, our remit has widened well beyond peer support. We now engage regularly with civil aviation, customs, the ministry of road transport, MSME, the Logistics Sector Skill Council, and increasingly with state governments on additional airports, facilities, manpower and capacity building for international cargo movement.

Building the next generation

Q: What role does ACAAI play in capacity building?

Empowering our members through information sharing and skill development is central to our mandate. We maintain regular communication



SAMIR J SHAH
PRESIDENT ACAAI

on industry and regulatory developments, and we run webinars and meetings to help members adapt. We have just completed three training programmes in the last two months and are in the process of setting up an air cargo training institute that will go beyond basic cargo training to prepare the next generation of entrepreneurs entering the sector.

Where the friction lies

Q: What operational challenges do air cargo agents in India face?

There are two broad categories of challenges. The first is infrastructure that remains insufficient, alongside a persistent shortage of trained manpower. The second is that existing regulations are often not implemented correctly, by either industry or the regulator, and our internal studies suggest that consistent implementation alone would smooth out a large share of current friction. Building and automating infrastructure takes time and capital, so we are engaging with investment companies and custodians on this while also pushing regulators to apply the rules in the spirit they were written.



AGENTS WHO COMPETED WITH EACH OTHER STOOD TO GAIN MORE FROM TALKING THAN FROM STAYING SILOED, BECAUSE A COMPETITOR UNDERSTANDS THE SAME OPERATIONAL PAIN POINTS AND OFTEN HAS DIFFERENT SOLUTIONS TO THE SAME PROBLEMS

Making the case for Air Cargo

Q: What is the growth trajectory for air cargo in India?

Air cargo has historically been perceived as an expensive mode suited only to certain commodities and shippers. We are working with industry bodies such as CII, ASSOCHAM and local chambers of commerce to make the case for air cargo as a genuine alternative, particularly for exporters and importers in landlocked states such as Jharkhand, Bihar, Uttar Pradesh

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and Madhya Pradesh, where seaports are far away and involve multiple handling stages. We tell shippers to always compare air and sea freight on a door to door basis rather than a leg by leg one.

There is also a bigger opportunity ahead. If the government's proposal to add around 150 more airports across the country becomes a reality, the nearest airport for most of the country will be within 40 to 100 kilometres. That will give a big push to e-commerce, courier shipments and smaller exporters and importers.

A seat at the table

Q: Is ACAAI seeking specific policy support from the government?

We want to be part of policy preparation, not just reactive to it, and most government policymakers do talk to us before they implement any significant change. At the same time, we try to remain neutral in policy

matters even while representing our members, because logistics policy has to account for all stakeholders, not just ours.

Tools, not replacements

Q: How is technology, including AI, changing the way agents do business?

Digitisation and AI are facilitating tools, not replacements, for either the physical movement of cargo or the people who process it. Somebody still has to enter the data, understand the context and apply domain knowledge for any of this technology to actually help. My advice to the industry is to focus on two things: improving English communication skills, since documentation and processing largely happen in English, and strengthening domain knowledge, since technology accelerates processing but cannot substitute for understanding why particular data is entered at a particular

point in a shipment's journey. Efficiency gains from technology could reduce headcount in back office documentation and customer service roles over time, as staff become able to handle a higher volume of shipments each. Beyond that shift, I do not see technology displacing the physical processing or movement of cargo. Both are only going to increase.

The president's agenda

Q: What is your agenda as ACAAI president?

My priority is deepening our engagement with regulators beyond our traditional counterparts of the Directorate General of Foreign Trade, the Ministry of Civil Aviation and the Central Board of Indirect Taxes and Customs. We have widened that scope to include MSME, the Logistics Sector Skill Council, the Bureau of Indian Standards, APEDA and other partner government agencies, along with a growing push to

DIGITISATION AND AI ARE FACILITATING TOOLS, NOT REPLACEMENTS, FOR EITHER THE PHYSICAL MOVEMENT OF CARGO OR THE PEOPLE WHO PROCESS IT

sensitise state governments on logistics, since land and industry set-up largely fall under state jurisdiction. We are also working with the Logistics Sector Skill Council to bring more Indian colleges into offering graduate and postgraduate logistics programmes and certificate courses, while staying in continuous dialogue with airlines and pushing for greater support from risk management and financing agencies for our members. 



CYCLONES AND WIND RISK IN ODISHA: A PARAMETRIC INSURANCE VIEW

Odisha's coastline has long been exposed to cyclonic activity from the Bay of Bengal. What has changed in recent years is the intensity and unpredictability of these systems. Peak wind speeds are rising, and their track and behaviour are harder to forecast. Major cyclonic events such as Fani, Amphan, and Yaas illustrate how high-impact wind systems are now affecting not only coastal regions but also inland districts, extending the risk footprint well beyond the traditional coastal belt.

This shift is increasing both asset exposure and the complexity of risk accumulation. Critical sectors such as ports, power, infrastructure, and agri-value chains are particularly affected. Power transmission and distribution networks face repeated outages and restoration costs after high-wind events, while agri-value chains, from standing crops to storage and cold-chain logistics, are exposed to both direct damage and disruption in movement of goods. Aquaculture and coastal industrial clusters,

both significant to Odisha's economy, carry similar vulnerability.

In many cases, the impact is not limited to physical damage. Port operations are routinely suspended once wind speeds exceed safety limits, leading to revenue losses even when there is no structural damage. Factories and processing units in high-wind zones face similar disruption, halting operations as a precaution without sustaining any insurable physical loss. From an insurance standpoint, this is where a risk gap emerges. Losses of the kind described above, where operations stop but nothing is physically damaged, i.e. non-damage business interruption (NDBI) is precisely the gap that parametric insurance structures are designed to address.

In this context, parametric insurance solutions based on objective wind-speed triggers are emerging as an effective complement to traditional insurance covers. By enabling predefined payouts linked to wind thresholds, these solutions address liquidity gaps arising from such disruptions and reduce



MS. NEHA YADAV

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claim uncertainty. Payouts are typically faster than indemnity-based claims, since there is no dependency on loss adjustment or damage assessment, allowing businesses to access funds precisely when operational cash flow is under the most stress.

With improved access to meteorological data, satellite monitoring, and catastrophe modelling, these solutions are becoming increasingly relevant

in managing wind-related risks. For a state like Odisha, where industrial growth, agri-based livelihoods, and coastal infrastructure development are all expanding in wind-exposed geographies, parametric covers offer a way to build financial resilience alongside physical resilience. Parametric insurance solutions are increasingly helping businesses and communities absorb shocks without waiting on lengthy claims cycles.

THE GREAT GREEN TUGS PUSH

How a mandate to decarbonise harbour towage is creating an industry around it

From Antwerp to Kandla and Mumbai, a mandate to decarbonise harbour towage is creating an industry around it: batteries, shipyards, charter economics and charging infrastructure, all moving at once. India's first operator to win a green tug tender explains what it will take to make the technology pay off over 15 years.

At Cochin Shipyard, the hulls of two 60-tonne harbour tugs are around 70 per cent complete. When they enter service at Jawaharlal Nehru Port Authority (JNPA) in 2027, they will run on batteries charged with green power, and their owner, Polestar Maritime, estimates they will remove around 1,500 tonnes of fossil fuel from the port's towage operations every year.

They are not the only electric tugs taking shape in India. At Mandovi Drydocks in Goa, steel was cut in December 2025 for what the government called the first tug under its Green Tug Transition Programme (GTTP), a 60-tonne battery-electric vessel for Deendayal Port at Kandla. Since then more ports have signed contracts, Indian yards are building electric tugs

on repeat, and international suppliers, from a Swedish battery maker to a Canadian naval architect and a Danish towage major, have found good reason to be in the room. Europe's first all-electric RSD tug has already been in commercial service for more than a year, and Singapore has turned charging standards into public policy. The question is no longer whether an electric tug can be built. It is how quickly the industry forming around it, shipyards, battery suppliers, charterers and port infrastructure, can turn early orders into a repeatable business.

Why the Humble Harbour Tug Matters

A harbour tug looks unremarkable next to the 20,000-TEU container ships it nudges into berth.

Its working pattern, however, makes it an unusually good candidate for cleaner propulsion. It operates within a fixed patch of water, returns to the same base after every job and can move from standby to full power within minutes. That combination of a predictable routine and a demanding peak-power requirement makes planned charging possible, provided the vessel can still deliver full power the instant a large ship needs assistance. It is why harbour towage has become the test bed for maritime decarbonisation.

Europe Has Put Electric Towage to Work

In May 2025, the Port of Antwerp-Bruges launched Volta 1, which it describes as Europe's first all-electric RSD tug. The vessel shows that battery-electric propulsion can deliver the power conventional harbour towage demands, and it shifts attention to the port: a battery tug is only as useful as its ability to recharge between jobs. The international experience is also showing that a battery-electric tug is not a single



specification. Svitzer and Cochin Shipyard signed an agreement in December 2025 for at least four 26-metre battery-electric TRANSverse 2600e tugs, with an option for four more, built in India for Svitzer's global fleet. Construction began in September 2026. Kongsberg Maritime is supplying the electrical, automation, propulsion and shore-charging package, with each vessel powered by a 4.8 MWh battery system driving two 2,000 kW permanent-magnet motors, a materially larger power package than Volta 1's.

That a global towage operator has chosen an Indian yard for its own electrification programme is a strong vote of confidence in Indian shipbuilding.

India Moves From Policy to Hardware

The GTTP was announced in May 2023 and formalised through a standard operating procedure launched in August 2024.

Phase 1 runs from 1 October 2024 to 31 December 2027, with an initial investment estimate

of roughly ₹1,000 crore. The sequencing is deliberate: battery-electric tugs first, with room for hybrid, methanol and green-hydrogen vessels as those technologies mature, building towards a fully green fleet at India's major ports by 2040. A 2026 DGMA framework puts the wider addressable fleet at roughly 400 harbour tugs nationally, the market to be addressed over time rather than vessels already under contract. The contracting model is where the economics become interesting. GTTP tenders are structured as 15-year charters awarded through transparent tendering. The operator finances, builds, crews, operates and maintains the vessel, putting battery degradation, charging reliability and technical management on the charterer's books rather than the port's.

Where the Orders Stand

The Ministry of Ports, Shipping and Waterways confirmed in March 2026 that Deendayal, JNPA, Visakhapatnam and V.O. Chidambaranar had placed work orders for electric tugs. Mumbai joined them in September, and several other ports are at tender or negotiation stage.

Kandla Sets the Benchmark

Kandla is where

the policy first became steel. Deendayal Port Authority awarded the 15-year charter for its 60-tonne electric tug to Netincon Marketing, part of the Ripley Group, at a reported ₹6.30 lakh a day. Construction began at Mandovi Drydocks in December 2025, with Kongsberg Maritime as system integrator and Swedish specialist Echandia supplying a 4.4 MWh lithium titanate (LTO) battery.

The battery detail matters. Echandia designed the system for a 15-year life and 30,000 charging cycles with no planned mid-life replacement, which is central to the economics of a 15-year charter. Kandla will be an early live demonstration of how battery life, charging discipline, crew readiness and vessel availability hold together over a contract's length, and its lessons will inform every project that follows.

JNPA: Inside Polestar's Two Battery-Electric Tugs

Polestar Maritime, which describes itself as the largest independent harbour tug owner and operator in India, was the first winner of a GTTP tender for two battery-operated tugs, at JNPA. The company welcomes the government's approach of building green tugs to the standards set in the GTTP guidelines and of having ports charter them through a transparent tendering system.

WE ARE FOCUSING TO ENSURE THAT TUGS OF HIGH QUALITY ARE IN SERVICE AT JNPA AT THE EARLIEST IN 2027

What sets the JNPA tugs apart is the full green loop: the batteries will be charged at the port with green power. On that basis Polestar estimates the pair will eliminate approximately 1,500 tonnes of fossil fuel use and save around 1,000 tonnes of carbon emissions every year.

Built for a 15-year working life

Polestar is clear that quality of construction and on-board features will decide the quality of service. Because the technology is new, it says, the company and Cochin Shipyard have insisted on high standards and proven equipment throughout. The design comes from Robert Allan, the Canadian naval architect behind the majority of electric tugs operating worldwide. The timeline Polestar placed the order in January 2026 and reports that construction is proceeding smoothly, with hull work almost 70 per cent complete. All equipment factory tests are expected to be completed by January 2027 and major equipment to arrive by March 2027, after which the tugs will be launched and go through





Volta 1 By The Numbers

24.73 M
Length

70 T
Bollard pull

2.782 MWH
Battery

12 HRS
Operation

2 HRS
Recharge

1.5 MW
Charger

sea trials. The first tug is expected in service between May and July 2027 and the second around August 2027, both ahead of the contracted delivery date of October 2027.

The budget, roughly

Polestar did not disclose the build cost, but the charter rate gives a clear sense of scale. JNPA's awarded rate of ₹5,89,500 per tug per day has since become a reference point in negotiations at other ports. Worked through over the life of the contract, it points to a programme worth well over ₹600 crore across the two vessels.

What it means for ports and shipping

- **Zero-emission harbour operations.** Charged with green power, the tugs remove diesel exhaust from berthing and unberthing at India's largest container port.
- **A service, not an asset.** JNPA buys guaranteed towage availability for 15 years; the operator carries the technology and lifecycle risk.
- **A new skill base.**

Owners must train key staff on board and on shore, especially in the electrical and electronic systems.

- **A template for the fleet.** Performance at JNPA will help set the specification for the next round of tenders across major ports.

Making a 15-Year Charter Work

Battery-operated tugs cost considerably more to build than tugs running on fossil fuel, Polestar notes. What makes the charter model viable is a shared, long-term objective: JNPA and the Indian Ports Association have been clear that the tugs must be capable of serving for the full 15 years.

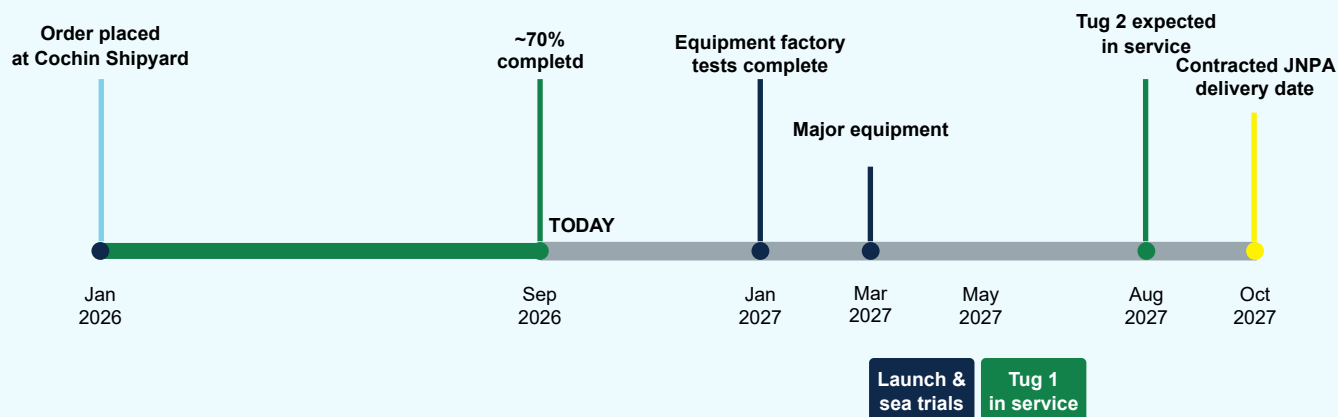
That puts the emphasis on durability over headline price. Beyond build quality, Polestar says owners will need to train key staff on board and on shore, particularly for the tugs' electrical and electronic systems, and to monitor every aspect of performance closely in the early years. Rather than name a date for cost parity with diesel, the company points to the length of the contract itself: the

AS TECHNOLOGY IS NEW, WE WILL HAVE TO BE EXTRA CAREFUL TO MONITOR ALL ASPECTS OF THE TUGS

investment pays back over the vessel's working life, provided the vessel stays available. The rate data shows how the commercial conversation has developed. Kandla's ₹6.30 lakh was the early ceiling; JNPA's ₹5.895 lakh has since featured in negotiations elsewhere. New Mangalore's lowest bidder opened at ₹6.25 lakh and, once the port pointed to lower rates elsewhere, came back at ₹6.08 lakh. Chennai followed a similar path before agreeing to match JNPA. Ports are seeking the lowest long-term cost, while operators need enough margin to run a new class of asset for fifteen years. How that balance settles will shape how quickly the next round of tenders closes.

JNPA'S Two Battery-Electric Tugs: The Road to Service

Polestar Maritime / Cochin Shipyard build schedule, as stated by Polestar



How Success Will Be Measured

Every parameter matters, from lifecycle costs to emissions avoided, Polestar says, and the risks attached to each can be managed by choosing the right suppliers. One measure stands above the rest. Polestar also makes a case for quality in procurement. Ports and government, it argues, must ensure standards are not compromised by unproven, low-cost battery technology from any service provider, since that can create serious safety and operational hazards. Battery prices are fluctuating worldwide, making it hard to be certain how cheaper technology will perform. The company respects the lowest-bidder policy, but believes that for new technology, ports should factor in that the cheapest option is not always the least expensive over a vessel's life.

What Is Actually Inside a Green Tug

A battery-electric harbour tug is not a diesel tug with the engine pulled out. Its electrical architecture has to absorb sharp swings in power demand while keeping enough reserve for manoeuvring, emergency response and a safe return to port. Knowledge Marine & Engineering Works (KMEW)

arrived from a different direction, as a dredging company rather than a tugbuilder, and now holds three GTTP contracts at V.O. Chidambaram, Visakhapatnam and Mumbai, worth a combined ₹1,049 crore including taxes. Its first two vessels share a common Navnautik-designed platform: 33.55 metres long, 11.6-metre beam, 4.5-metre draught and 60 tonnes of bollard pull, with Berg Propulsion motors and thrusters and Echandia LTO batteries designed for a 15-year life. KMEW's tugs carry dual diesel gensets, but the battery remains the primary propulsion source and the gensets exist

purely as a safety margin. For a vessel that may assist a large ship in difficult conditions, that margin is what allows a port to commit to a 15-year contract with confidence. The strategy is standardisation: the same hull, battery and propulsion package repeated across contracts, so that cost and learning carry from one vessel to the next.

Hindustan Shipyard is at an earlier stage. It signed an MoU with the Indian Ports Association in October 2025 to explore green and hydrogen tug development and is currently building conventional 60-tonne tugs for Visakhapatnam Port,

ONLY AFTER SEEING ACTUAL PERFORMANCE OVER A PERIOD OF AT LEAST THREE TO FIVE YEARS SHOULD THE GOVERNMENT DECIDE ON THE WAY FORWARD

with a future electric order under discussion.

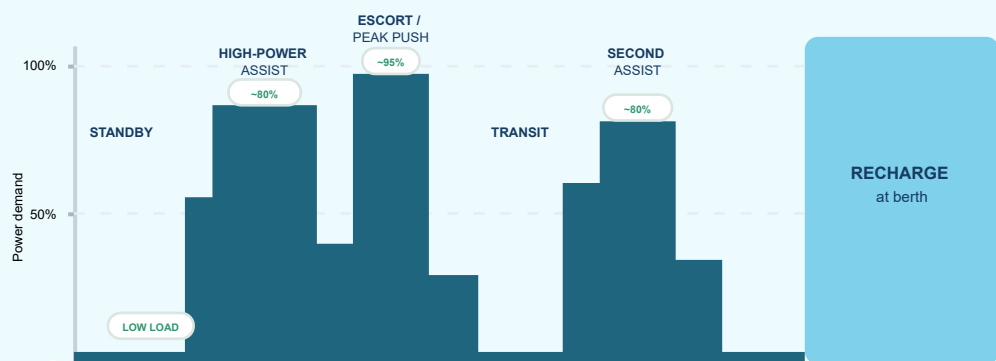
Charging: The Shore Side of the System

The vessel is only half the system; shore infrastructure completes

Why Tugs Suit Batteries

A Short, Spiky, Predictable Duty Cycle

Illustrative shift profile · Long idle periods · Short bursts of full power · Return to the same base



Duty-cycle profile retained from the supplied infographic; visual treatment redesigned for a modern editorial layout.

GTTP Roadmap: From 16 Tugs to a Green Major-Port Fleet



it. At JNPA, charging with green power is built into the project from the start. Across the GTTP more broadly, charging does not yet appear as a separate line item in public procurement data the way the tug itself does, which is a matter of visibility rather than absence.

Supporting one electric tug with a dedicated charger is relatively simple. Five or ten at the same port changes the engineering equation: transformer capacity, switchgear and charging windows must be planned around a fleet. The goal is not simply that a tug can charge,

but that it is always charged when a ship needs it, which makes charging as much an infrastructure opportunity as a shipbuilding one.

The Bigger Opportunity Is Under the Hull

Every tug in this programme has to be built in India, and Indian yards already know how to fabricate a steel hull. The larger prize sits one layer down: battery modules and their management systems, power electronics, and propulsion motors and thrusters that still come largely from European suppliers.

That is why the JNPA tugs' Indian-made batteries matter. Scale the GTTP to dozens of vessels, and this layer will determine whether India has won a shipbuilding contract or built a new industry. The CSL-HBL Engineering joint venture, covering marine batteries, battery management systems, electric motors, power electronics and charging infrastructure, adds a further piece to that localisation story.

No Single Fuel Will Win

India is not electrifying in isolation. Singapore has made charging the centrepiece of policy: in March 2025 the Maritime and Port Authority of Singapore and Enterprise Singapore introduced Technical Reference 136, a standard for safety and interoperability in electric harbour-craft charging

and battery-swap systems, backed by financing support and a 2030 mandate that new harbour craft run fully electric, on B100 biofuel, or on a net-zero fuel. Europe is hedging across technologies, running Volta 1 alongside hydrogen and methanol trials. Batteries have a natural advantage in short, repeatable harbour work, while methanol and hydrogen may suit operations that need greater endurance.

Methanol is easier to store and handle as a liquid, though its climate benefit depends on how it is produced. Hydrogen fuel cells produce no direct CO₂ at the vessel, but storage, bunkering and cost are still being worked out. India is positioning for a mixed fleet: Deendayal, Paradip and V.O. Chidambaram are designated Green Hydrogen Hubs under the National Green Hydrogen Mission.

From First Tugs to a Fleet

India and the wider industry have shown that a 60-tonne harbour tug can be built around batteries, in Kandla, in Antwerp, at Cochin for a global operator and now for JNPA. The next phase is commercial: delivering vessels on schedule, proving that batteries hold up over 15 years, guaranteeing reliable charging and making the economics work for the operators who carry the risk. Polestar's message is that quality is the shortest route

ABOUT POLESTAR MARITIME

Polestar Maritime describes itself as the largest independent harbour tug owner and operator in India. It was the first winner of a Green Tug Transition Programme tender, for two battery-operated 60-tonne tugs to be chartered to JNPA for 15 years.

The tugs are under construction at Cochin Shipyard to a Robert Allan design, with ABB as electrical integrator, Kongsberg Maritime propulsion and batteries from an Indian company.

to all of those goals. Proven suppliers, trained crews, careful monitoring and three to five years of real operating data will give ports and government the evidence to scale the programme with confidence. Right now the picture is a growing set of hulls under construction, tenders at every stage and a supply chain that is steadily localising. With JNPA's first tug due in service by mid-2027, the next 18 to 24 months will show how quickly the electric tug moves from well-publicised first to everyday workhorse at India's ports. 

The JNPA Project at a Glance

2

battery-electric tugs,
60T bollard pull

~1,500 T

fossil fuel
eliminated a year

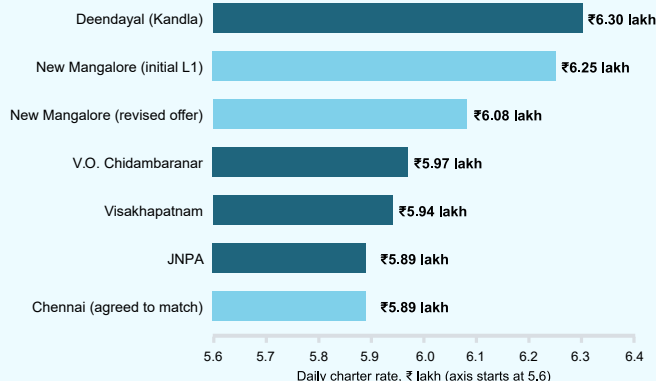
~1,000 T

carbon emissions
saved a year

15 YRS

charter with JNPA

The rate Curve: Daily Charter Rates for 60T Green Tugs



Green tug charter rates by port

Port	Reported / Negotiated Rate	Status
Deendayal / Kandla	₹6,30,000/day	Awarded
New Mangalore	₹6,25,444 initial L1; later ₹6,08,000	Negotiation
V.O.C	₹5,96,695/day	Awarded
Visakhapatnam	₹5,94,468/day	Awarded
JNPA	₹5,89,500/day	Awarded
Chennai	₹5,94,400 initial L1; agreed to match ₹5,89,500	Award pending

Figures are not perfectly comparable: tender scope, tax treatment and procurement stage differ.

Three approaches to the same problem

	India	Singapore	Europe
Primary approach	GTTP	Harbour-craft decarbonisation	Multi-technology fleet transition
Commercial model	Long-term charter	Financing + operator ecosystem	Port / operator-led projects
Infrastructure	Emerging; green charging at JNPA	Charging standards established	Port-specific
Key milestone	GTTP tugs under construction	TR 136 charging standard	Volta 1 in service
Global relevance	Indian yards building for export	Hub setting technical standards	Mature market testing options

The evaluation scorecard

Metric	Why it matters	Polestar's view
Vessel availability	A port must know a tug is ready when a ship calls	Will always remain key
Emissions avoided	The core environmental case for the programme	Important; ~1,000 t a year expected
Battery efficiency and health	Decides whether the vessel lasts 15 years	Managed by choosing proven suppliers
Charging performance	Links vessel readiness to shore infrastructure	Managed by choosing proven suppliers
Lifecycle operating cost	Underpins the charter economics	Important; judge over the full term

India's green tug order book

Port / Project	Requirement	Charterer / Bidder	Current Position
Deendayal Port, Kandla	1 × 60T BP	Netincon Marketing / Ripley Group	Awarded; construction commenced
JNPA	2 × 60T BP	Polestar	Awarded; hull ~70% complete at CSL
V.O.C	1 × 60T BP		Awarded
Visakhapatnam	1 × 60T BP		Awarded; delivery targeted Q4 2027
Mumbai Port	1 × 60T BP		Awarded 19 Sept 2026
New Mangalore	1 × 60T BP	Underwater Services Company	Negotiation stage
Chennai	1 × 60T BP	Underwater Services Company	Rate agreed; award pending
Cochin Port	1 × 60T BP	Not yet public	Tendered
Paradip	1 × 60T BP	Not yet public	Tendering / procurement
Svitzer / CSL (export)	4 × 26 m + 4 options	Svitzer	Construction commenced Sept 2026

BP = bollard pull. Awarded, under construction, tendered and under negotiation are different stages; the Indian market has vessels at all four.

JNPA green tugs: indicative numbers

Measure	Per Tug	Two Tugs
Daily charter rate	₹5.90 lakh	₹11.79 lakh
Annual charter value	≈ ₹21.5 crore	≈ ₹43.0 crore
15-year charter value	≈ ₹322.7 crore	≈ ₹645.5 crore
Fossil fuel avoided over 15 years		≈ 22,500 t
Carbon emissions saved over 15 years		≈ 15,000 t

Maritime Gateway calculation from the awarded daily rate, assuming 365 billable days, before taxes and any escalation. Environmental totals extrapolate Polestar's annual estimates over the charter term.

Who is building the JNPA Tugs

Element	Partner / Detail
Owner and operator	Polestar
Shipyard	
Naval architecture	
Electrical integrator	ABB
Propulsion	Wärtsilä
Battery	Indian supplier
Charging	At JNPA, using green power
Order placed	January 2026
Contracted delivery to JNPA	October 2027

MORE CARGO, THINNER MARGINS

INSIDE INDIA'S EARLY FESTIVE RUSH

India's festive logistics cycle has begun early, with freight activity up 6–7% year-on-year. Earlier inventory build-up, resilient consumption, rising transport costs and smarter use of technology are reshaping how companies prepare for a longer, less predictable peak.

Jitendra Srivastava, CEO, Triton Logistics & Maritime, discusses the implications of it all.

India's festive season is no longer a single peak. It is becoming a rolling demand cycle, stretching across several months as one celebration follows another. And this year, logistics companies are preparing earlier than usual.

Freight activity in July–August is already 6–7% higher year-on-year, while rail freight is growing at roughly 9–10%. According to Jitendra Srivastava, dispatches began around mid-July, earlier than the usual August acceleration, with September and October expected to bring a further rise.

The early movement is not just about higher demand. It reflects a fundamental change in how companies are managing uncertainty.

Early preparation comes at a price

The extra caution is visible across the logistics cost structure. Road transportation costs have

The objective is straightforward: when consumers start buying, the product should already be close enough to reach them

increased by around ₹40–60 per km, while LTL (Less Than Truckload) rates have risen by ₹5–8 per tonne-km. Spot-booking premiums are up 15–25%, as companies pay to secure capacity ahead of the peak. Spot commercial road freight rates are carrying another 10–14% premium, particularly in supply chain and e-commerce movements.

Air freight has surged by approximately 20–22%, ocean freight by 10–15%, and last-mile costs by around 7–10%.

That makes early planning something of a trade-off. Securing capacity ahead of time can protect companies from even higher spot-market costs later, but holding inventory for an additional two or three weeks also means paying for storage earlier.

Technology becomes the buffer

That is where digitalisation is beginning to make a measurable difference. Government initiatives, including the National Logistics Policy and Unified Logistics Interface Platform (ULIP), along with automated e-way bills, electronic tracking and API-linked milestones, are reducing friction in the logistics chain. Srivastava estimates that paperwork has fallen by 20–30%, while delivery

predictability has improved by 8–10%. Digital booking platforms have also reduced intermediary commissions by around 10–20%.

The bigger change is predictive. Route planning, real-time visibility, consumer-behaviour analysis and fulfilment-centre positioning allow companies to anticipate where cargo needs to go and how quickly it can get there. Technology cannot prevent a sudden road closure or cloudburst, but it can reduce the time taken to respond. That may be the real shift taking place in India's festive logistics network.

Consumption holds up

The resilience of domestic consumption is perhaps the more surprising part of the story. The war and broader geopolitical uncertainty have affected costs, exports and pricing, but Srivastava says Indian consumers are continuing to spend during the festive season. E-commerce buying behaviour is also picking up.

“We Indians, we want to really enjoy and celebrate,” he says. The cargo numbers reflect that momentum. From the broader freight perspective, iron ore, fertilisers and food grains are among the strongest-growing categories. On the consumer side, retail and electronics

The more technologically advanced you are, the more you will be able to predict the unpredictability

movements are growing by around 12–15%, while consumer electronics are up 15–18%. Manufacturing goods and consumables are growing by around 11–12%. The picture is less positive on the export side, where the war has affected production costs, landed costs and sentiment. Domestic consumption, however, remains comparatively resilient.

No single mode wins

Peak-season logistics is consequently becoming more multimodal. Air is a mode many shippers are currently avoiding because of its cost. Instead, companies are combining rail for longer hauls with road for the last mile. Coastal movements between India's west and east coasts are also being explored where they make economic sense. Rail movements alone have grown strongly. There is no fixed formula. “The mix and match are important,” Srivastava says. Inland waterways remain much less developed as a peak-



JITENDRA SRIVASTAVA
CEO, TRITON LOGISTICS &
MARITIME

season option. Government investment is expanding infrastructure, but seasonal conditions and unpredictable river levels continue to make inland-waterway movements difficult to rely on consistently.

People can still disrupt the plan

Technology may be changing logistics, but festive-season operations remain heavily dependent on people. Overlapping festivals can send drivers and logistics workers back home just as cargo volumes rise, creating shortages and forcing companies to pay premiums for transport.

“Now you have got something to be delivered; of course, you have to go and pay somebody a premium to get the deliveries done,” Srivastava says. Those costs ultimately enter the landed cost.

Documentation can create another costly failure point. An expired e-way bill, he notes, can attract a penalty starting at ₹10,000. Meanwhile, reverse logistics has become a significant part of e-commerce planning, with around 25–30% of e-commerce volumes requiring reverse movement.

More revenue, thinner margins

This is where the festive-season story takes an unexpected turn. More cargo does not necessarily mean more profit. Spotting vehicles, temporary labour, fuel, congestion, reverse logistics and advance inventory all add costs. Srivastava estimates that these pressures can result in a 15–25% hit to margins, depending on operating conditions. Asked whether logistics companies are making more money from the

festive surge, his answer is blunt: “No, in fact it has reduced.” The reason is the growing cost of unpredictability. A road closure or extreme weather event can force a truck onto a much longer route. A shortage of drivers can push up spot rates. Inventory brought forward by three weeks has to be stored for three additional weeks. The festive rush may lift the top line, but it can simultaneously squeeze the bottom line.

Earlier inventory build-up

Retailers and supply-chain operators are moving inventory two to three weeks earlier, filling fulfilment centres and regional hubs ahead of demand. The objective is straightforward: when consumers start buying, the product should already be close enough to reach them.

Preparing for the unpredictable

The industry is not eliminating uncertainty. It is learning to price it, plan for it and increasingly predict it. Srivastava's conclusion is simple:

Reverse logistics has become a significant part of e-commerce planning, with around 25–30% of e-commerce volumes requiring reverse movement

“The unpredictable nature is not going to change, and logistics is one area that is full of disruptions.” And his prescription is equally direct: “The more technologically advanced you are, the more you will be able to predict the unpredictability.”

For logistics companies heading into another high-volume festive season, that may be the more important measure of progress; not simply how much cargo they move, but how well they keep it moving when the plan inevitably meets the unexpected. 



THE STEEL CUTTING THAT MATTERS

SVITZER'S INDIA BET

Deniz Kirdar True, Managing Director, Asia, Middle East and Africa at Svitzer, speaks to Kalpana Pandey about why the world's most advanced green tug is being built in India, and what it means for the country's shipyards.

As Svitzer's TRAnverse 2600e tugs take shape at Cochin Shipyard and Swan Defence and Heavy Industries, Deniz Kirdar True explains the thinking behind the company's India bet, and what it will take for Indian ports to put green tugs to work.

Q. What makes this project strategically important for India's maritime sector, and how does it align with your long-term plans in the region?

The steel cutting matters for a straightforward reason: the most advanced green tug being built today is being built in India.

Svitzer selected Cochin Shipyard following a competitive evaluation of leading shipyards worldwide, assessing capability, quality, price, yard availability and delivery experience. Indian yards were chosen on merit, and we have now done so twice: the second contract is with Swan Defence and Heavy Industries in Gujarat. Between them, eight Svitzer tugs will soon be under construction in India.

For India's maritime sector, the significance is that the capability

being developed here does not leave. Expertise in electric propulsion, high-specification construction and the associated skills is being built at Cochin, and stays at Cochin.

For Svitzer, this is not a one-off procurement decision. We already operate in India, at Pipavav, and our intention is to hold a long-term position in the Indian port sector.

Q. What operational advantages do you expect the TRAnverse 2600e to deliver in Indian ports compared with conventional diesel tugs, in terms of efficiency, emissions and total cost of ownership?

One clarification first: these four vessels are being built in India for Svitzer's global fleet renewal programme. That said, we would very much like to see TRAnverse tugs working in Indian ports and terminals, and we believe the case for them here is a strong one.

On operations, the TRAnverse was designed to remove constraints rather than simply to pull harder. It delivers faster and more predictable vessel movements, which protects

berth productivity and turnaround times, and it can work at any position around the ship without repositioning. The practical result is that a port can do more with the berths, channels and pilots it already has, without a proportional increase in fleet size or new infrastructure. On emissions, when charged from green power sources, these vessels produce zero direct emissions during harbour operations.

On total cost of ownership, the honest answer is that it depends on the port. A battery-electric tug may cost more to build than a conventional one and less to run. Where the balance falls depends on the duty cycle, the number of assists, the cost and availability of power, and the charging arrangement at the berth. We would rather work that calculation through with an individual port than publish a single figure that fits none of them.

What we can say with confidence is that this is proven equipment. More than 3,000 commercial towage jobs have been completed with the TRAnverse class, and Svitzer has 18 vessels of the design under construction worldwide.



THE CAPABILITY BEING DEVELOPED HERE DOES NOT LEAVE. IT IS BEING BUILT AT COCHIN, AND STAYS AT COCHIN

DENIZ KIRDAR TRUE,
MANAGING DIRECTOR,
ASIA, MIDDLE EAST AND
AFRICA (AMEA), SVITZER



Q. How does Svitzer see the role of international maritime players in accelerating India's transition to low- and zero-emission vessels, and what capabilities or partnerships are most critical?

International operators bring demand, operating experience, technology requirements and international standards. Indian



AN ELECTRIC TUG PERFORMS TO THE STANDARD OF THE POWER AVAILABLE TO IT, AND ADOPTION WILL MOVE AT THE SPEED THAT INFRASTRUCTURE IS INSTALLED

shipyards bring industrial capability, skilled people, infrastructure and delivery. Capability transfers through difficult work. That is why Svitzer is placing its most advanced design in India. Export contracts matter for a second reason. They give a yard the reference credentials that open the next contract, and the one after that. India's shipbuilding ambitions will not be met on domestic demand alone.

As for the partnerships that count most, we would name three: shipyards prepared to take on new technology rather than repeat established designs; ports and terminals willing to plan vessels and shore-side infrastructure together; and equipment and service providers building a presence close to where the vessels will work.

Q. How does Svitzer balance electrification, alternative fuels and hybrid solutions across different port contexts, and what criteria guide the recommendation?

The questions that matter are how many assists a day, over what distances, with what idle time in between, and what power is available at the berth. A tug working intensively over short distances and returning to a fixed berth is a strong candidate for full electrification. One working longer distances, or operating where reliable shore power is not yet available, is better served by a hybrid or biofuel-capable configuration. The TRAnverse platform was built for precisely this variation. The same design is available in battery-electric, hybrid and conventional diesel configurations that are biofuel drop-in ready, which means the propulsion decision does not require a change of vessel design. We would not presume to recommend a single pathway to Indian port authorities in the abstract. The right answer is specific to each port, and it is a conversation we are glad to have.

Q. What ecosystem enablers should Indian ports and policymakers prioritise to scale electric harbour



WE WOULD ALSO LIKE TO SEE THESE TUGS, OR THEIR SUCCESSORS, WORKING IN INDIAN PORTS. BUILDING THEM HERE IS A GOOD START

operations, and where are the biggest near-term bottlenecks?

Charging infrastructure at the berth is the clearest near-term bottleneck. An electric tug performs to the standard of the power available to it, and adoption will move at the speed that infrastructure is installed. Vessel planning and shore-side planning need to happen together rather than in sequence. The second enabler is commercial structure. Green tugs carry a higher capital cost, and the arrangements around them determine whether that cost is sustainable for both the operator and the port. The third is lifecycle support. Battery systems require monitoring, maintenance and eventual replacement, which means service capability, spares and technical competence located close to the ports where the vessels work. Crews also require training specific to electric propulsion. The Green Tug Transition Programme has already done the most difficult part by setting clear direction. Certainty is what allows industry to commit capital.

Q. How does Svitzer envision the evolution of next-generation tug technology in India over the next five to ten years, and what opportunities exist

Deniz Kirdar True
Managing Director,
Asia, Middle East and
Africa (AMEA), Svitzer

With Svitzer since 2014;
Managing Director, AMEA,
since February 2023

- Previously Global Head of Operational Excellence for the Svitzer Group, and General Manager, East Coast Australia

- Has held leadership roles across Svitzer's Egyptian, Philippine and Angolan operations

- MSc in Organisational Psychology, Birkbeck, University of London; BSc in Mathematics, Middle East Technical University

- Oversees Svitzer operations across 14 countries, including India

for Indian yards to become global hubs for advanced, low-emission workboats?

Over the next five to ten years, we expect electric propulsion to become normal in harbour towage rather than exceptional. We expect vessels and charging infrastructure to be planned together. And we expect tugs to be judged on what they do for a port, not only on bollard pull.

Indian yards already build for international customers, and Cochin's order book includes commercial export vessels alongside complex defence and commercial work. What a programme like this one adds is the demonstration that Indian shipyards can build advanced, low-emission vessels for an international fleet.

We would also like to see these tugs, or their successors, working in Indian ports. Building them here is a good start. 

NEPAL'S FLOOD-TESTED GATEWAY TO CHINA

Two flash floods in thirteen months have halted construction and pushed traders onto costlier alternatives, but two trade veterans say the corridor's long-term logic for turning Nepal into a land-linked economy still holds.

A **Corridor Under Water, Twice**
Nepal's most ambitious bet on a northern trade gateway to China has been tested twice in thirteen months.

On 8 July 2025, a glacial lake outburst flood on the Bhotekoshi river swept away the Nepal-China Friendship Bridge at Rasuwagadhi and destroyed more than 90 percent of the under-construction Timure dry port, after roughly 80 percent of the Rs 3 billion facility had already been built with Chinese-funded investment.

Then, on 26 August 2026, a second flash flood destroyed roughly 40 kilometres of the Galchhi-Rasuwigadhi highway and swept away 41 motorable bridges across Rasuwa and Dhading districts, once again severing Nepal's main road link to the Chinese border (Kathmandu Post).

Beijing has since written to Nepal's Ministry of Foreign Affairs to halt construction of the dry port, and officials in Kathmandu remain unsure whether the project will resume.

Temporary repairs, including a new track above the washed-out section near Ratmate and a request for China to open a short temporary route between Rasuwagadhi and Syafrubesi, are aimed at restoring some connectivity before Dashain. The episode has forced a wider reassessment of what Rasuwagadhi actually is: not simply a dry port under repair, but a live test of whether Nepal can build a dependable second trade artery to complement its India-facing routes.

Three Gates North
Nepal trades with China through three Himalayan crossings, each playing a different role. Tatopani, the oldest and closest to Kathmandu, was Nepal's primary gateway until the 2015 earthquake damaged the route, after which China and Nepal invested more heavily in Rasuwagadhi.

Korala, the newest crossing, sits at much higher altitude in Upper Mustang and, until this year, was seen mainly as a symbol of Nepal's ambition to diversify away from single-corridor dependence rather than a serious volume route. That balance

shifted again after the 2025 and 2026 floods. With Rasuwagadhi badly damaged and Tatopani periodically restricting Chinese container inflows, traders turned increasingly to Korala: since routes reopened in September 2025, the crossing has processed over 140 cargo containers and 230 electric vehicles, generating Rs 680 million in customs revenue, with a further 168 containers and 309 EVs still awaiting clearance (Kathmandu Post).

The cost is steep: transporting a container from Korala to Kathmandu runs to roughly Rs 250,000 against about Rs 50,000 from Tatopani, and takes two to three days rather than one, pushing up landed prices by an estimated 5 to 7 percent. Korala's advantage is resilience rather than economy; unlike flood-prone Tatopani and storm-damaged Rasuwagadhi, it has so far avoided the glacial and monsoon flood risk that has repeatedly closed the other two corridors, though its approach road remains only around 65 percent complete and winter access is limited at nearly 4,650 metres.



THE COMPLETION OF THE RASUWAGADHI ICD REPRESENTS NEPAL'S MOST SIGNIFICANT INVESTMENT IN ESTABLISHING A RELIABLE NORTHERN TRADE GATEWAY WITH CHINA

RAJAN SHARMA
GENERAL SECRETARY,
NEPAL-INDIA CHAMBER OF
COMMERCE AND INDUSTRY

What the Numbers Say

How much trade actually depends on these crossings is often overstated. Nepal's official FY 2082/83 customs data (mid-July 2025 to mid-July 2026) shows Tatopani was narrowly Nepal's largest China crossing by import value last fiscal year, not Rasuwagadhi, and the three Himalayan crossings combined carried only about a quarter

Crossing	Status (September 2026)	Key strength	Key constraint
Tatopani	Open, with periodic restrictions on Chinese container inflow	Closest to Kathmandu; Nepal's original, historically dominant route	No meaningful exports resumed since the 2015 earthquake
Rasuwigadhi	Dry port construction halted; highway destroyed by the August 2026 flood; temporary track under repair	Closest to the Kerung logistics hub; heaviest recent Chinese investment	Repeated glacial and flash-flood exposure on the Bhotekoshi river
Korala	Operating and absorbing diverted traffic	High-altitude route largely untouched by flood damage so far	Highest transport cost; approach road only ~65% complete; limited winter access

Sources: Sainju interview; Kathmandu Post reporting, September 2026



BALANCED CONNECTIVITY ENABLES NEPAL TO BENEFIT FROM REGIONAL INTEGRATION WHILE PRESERVING STRATEGIC AUTONOMY

of Nepal's total China-origin import value. Most of that trade, roughly three-quarters of it, already moves by sea through Kolkata and Vishakhapatnam and enters Nepal via Indian-border customs points such as Birgunj and Bhairahawa. On the export side the pattern reverses. China-bound exports are tiny in absolute terms, just Rs 1.89 billion nationally, but the three land crossings carry more than half of that value, and Rasuwagadhi alone accounts for nearly half of all exports to China, while Tatopani recorded zero. That imbalance means Nepal's limited export relationship with China

leans disproportionately on Rasuwagadhi staying open, even though the crossing barely moves the needle on the import side.

One Network, Many Gateways

Rasuwigadhi's significance is best understood against Nepal's existing dry-port network, most of which faces south. Publicly available reporting identifies five established inland container depots, Kakarbhitta, Biratnagar, Birgunj, Bhairahawa and Tatopani, of which only Birgunj has both rail and road links into India; the rest, including Rasuwagadhi, are road-only facilities.

That makes Rasuwagadhi's role complementary rather than substitutive: it is not positioned to replace Birgunj as Nepal's principal gateway for third-country trade, but it diversifies import routes, reduces dependence on a single southern transit system, and, if road connectivity holds, gives central

Nepal and Kathmandu a shorter path to Chinese and Tibetan markets.

Beyond Cargo: The Corridor Nepal Wants to Build

For Sharma, the value of the corridor was never only about container counts. A modern economic corridor, he argues, has to move people as well as goods: freight transport, tourism, business travel, education, healthcare access and cultural exchange should all sit alongside customs infrastructure, supported by modern immigration facilities, electronic visas, international bus terminals and multilingual information systems. On the physical side, he lists four-season resilient highways, modern Integrated Check Posts, cold-chain facilities, warehousing and logistics parks, and eventually rail connectivity linking Kerung to Kathmandu, as the elements still missing from the corridor. He also sees Rasuwagadhi as more than a bilateral link.

Voices from the Corridor: Rajan Sharma

Rajan Sharma is General Secretary of the Nepal-India Chamber of Commerce and Industry (NICCI); his professional background also includes trade and transport facilitation work with the Asian Development Bank.

Further insights:

- Soft infrastructure, the institutional, legal, regulatory and digital systems that make physical infrastructure efficient, matters as much as roads and depots. Sharma lists a National Single Window, electronic customs clearance, pre-arrival processing, mutual recognition of inspection certificates, electronic cargo tracking and risk-based inspection as priorities, warning that without these reforms, trucks may spend more time waiting at borders than travelling on highways.

- He believes the corridor could transform Nepal's logistics sector, turning freight forwarders into regional service providers offering multimodal transport, container leasing, cold-chain logistics, customs brokerage and digital logistics platforms, alongside thousands of new jobs in transport, warehousing, banking, IT, engineering and hospitality.

- Greater connectivity will mean greater interaction with China, he says; while that can bring tourism, technology transfer and investment, policymakers should also watch for trade imbalances, pressure on domestic industry and overdependence on a single market.

Technically, Nepal could handle three distinct trade models through the corridor: Chinese goods for domestic



**DISRUPTION TO
RASUWAGADHI, TATOPANI
OR KORALA IS A SUPPLY-
CHAIN AND COST-
PREMIUM PROBLEM, NOT
AN EXISTENTIAL ONE
FOR NEPAL-CHINA TRADE
OVERALL, SINCE MOST
OF THAT TRADE ALREADY
ROUTES AROUND THE
MOUNTAINS VIA INDIA**

RABI SHANKER SAINJU
TRADE AND TRANSPORT
FACILITATION EXPERT; FORMER
JOINT SECRETARY, NEPAL

consumption, transit cargo moving under customs control between China and India, and transshipment cargo consolidated or redistributed through Nepal before onward delivery. The second and third models, if realised, would draw the corridor into wider BIMSTEC trade, pulling China, India, Bangladesh and Bhutan into overlapping regional supply chains, though Sharma is clear this would require trilateral cooperation and a level of political trust that does not yet exist. That trust is the harder part. Sharma points to India's likely concerns, cargo security near sensitive borders, verification of transit containers,

and dual-use infrastructure with potential military implications, as rooted in geopolitics rather than commercial competition, and argues Nepal's best response is transparency: robust customs controls, diversified trade partnerships and balanced diplomatic engagement with both neighbours.

Building for the Next Flood

The two floods have also reframed what a climate-smart corridor should mean. Sainju notes that Rasuwagadhi and Tatopani have now both failed from glacial lake outburst floods and landslides within about thirteen months of each other, and argues that a resilient version of the corridor would need a functioning joint early-warning system for glacial and landslide risk, bridges and customs infrastructure engineered for repeat flash-flood loading rather than conventional river crossings, genuine multi-corridor redundancy so that a single disaster does not reduce Nepal to one working crossing, as happened in August 2026, and dry-port capacity spread across more than one site rather than concentrated at Tatopani. Whether that vision wins out is still an open question. The pattern since 2025, in Sainju's assessment, has been reactive: rebuilding to similar specifications after each disaster rather than redesigning around the recurring risk. He points to one hopeful sign, China's own leadership has publicly expressed interest in improved disaster

monitoring, which creates room to negotiate structurally different infrastructure in the next reconstruction phase. Whether Nepal takes that opening, or simply repairs the corridor and moves on, should become clear from the reconstruction decisions made over the next twelve to eighteen months.

Outlook

For now, Rasuwagadhi sits in an unusual position: too damaged to function as the flagship gateway it was meant to be, too strategically located to abandon. Korala is absorbing diverted trade at a cost premium, Tatopani is handling reduced Chinese container flows, and Beijing's intentions for the Timure dry port remain unstated. What Sharma and Sainju agree on, from different vantage points, is that the corridor's long-term case, connecting Nepal's economy northward while it continues to depend on India for the bulk of its trade, was never really about any single crossing surviving intact. It was about whether Nepal can build redundancy, resilience and institutional depth into a northern gateway strategy that, so far, has been tested more by nature than by policy.

**BALANCED CONNECTIVITY
ENABLES NEPAL TO
BENEFIT FROM REGIONAL
INTEGRATION WHILE
PRESERVING STRATEGIC
AUTONOMY**

Voices from the
Corridor:

Rajan Sharma

Rabi Shanker Sainju spent over three decades in Nepal's civil service, rising to Joint Secretary in the Ministry of Industry, Commerce and Supplies. He led Nepal's bilateral trade and transit negotiations with China, India, Bangladesh, Turkey and the United States, completed a transit protocol negotiation with China, and served as Executive Director of the Nepal Intermodal Development Board. He is now a trade and transport facilitation consultant with the Asian Development Bank and Vice Chair of the South Asia Watch on Trade, Economics and Environment (SAWTEE).

Further insights:

- Rasuwagadhi is often treated as a tangible Belt and Road-linked connectivity point, given its closeness to Kerung, which China has built into a regional logistics hub on its own side. But Sainju cautions against conflating what has been discussed with what has been delivered: the dry port and Integrated Check Post on the Nepali side remained only around 60 percent built even before the floods, and an optical fibre link via Kerung, floated as an alternative to Nepal's near-total dependence on Indian internet bandwidth, remains at the discussion stage.

- Nationally, smartphones (Rs 36.79 billion) were the single largest category of China-origin imports in FY 2082/83, ahead of diammonium phosphate fertiliser (Rs 20.98 billion), electric vehicles (a combined Rs 19.68 billion) and laptops (Rs 8.78 billion). Customs data cannot be broken down by entry point, but Sainju expects high-value, time-sensitive goods such as these, along with construction materials and festive-season consumer goods ahead of Dashain-Tihar, to be the categories most exposed to any Rasuwagadhi disruption. 

Corridor	Import value	Share of China imports	Export value	Share of China exports
Rasuwigadhi	Rs 45.74 bn	10.76%	Rs 894.6 mn	47.27%
Tatopani	Rs 14.41 bn	3.39%	Rs 205.6 mn	10.86%
Korala (Mustang)	Rs 14.41 bn	3.39%	Rs 205.6 mn	10.86%
Combined (3 corridors)	Rs 107.63 bn	25.31%	Rs 1.10 bn	58.13%

Sources: Nepal customs data, FY 2082/83, as analysed by Rabi Shanker Sainju. National totals: China-origin imports Rs 425.25 billion; China-bound exports Rs 1.89 billion.

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THE TRUST PROTOCOL

How Maalexi built the risk and settlement infrastructure that lets small agri-exporters trade with strangers across borders. Founders **Dr Azam Pasha** and **Rohit Majhi** spoke to **Kalpana Pandey**.



THE PROBLEM

Cross-border agri-trade has always run on relationships and paper promises. A container of rice leaves an Indian port on a letter of credit and a handshake; the seller, often a small or mid-sized exporter, waits weeks to get paid, absorbing quality disputes, currency swings and counterparty risk along the way.

The mechanisms that are supposed to make cross-border trade safer, inspection, documentation, insurance, due diligence, payment protection and legal enforcement, carry costs that are difficult to justify on smaller transactions. That priced smaller agricultural businesses out of the high-margin international markets they were best placed to serve.

Producers either sold through intermediaries at origin and sacrificed margin, or traded directly and carried the risk themselves. Buyers faced the mirror problem: paying unfamiliar suppliers with no reliable evidence of what would actually arrive.

Between them, the founders cover the disciplines the platform has to hold together: Pasha's career spans physical trade, financial markets and digital infrastructure, while Majhi brings the engineering depth behind the AI, IoT and blockchain layers.

Stage	What Happens
Inventory	Physical stock is registered — e.g. a 40' container of rice, grade 1121.
Inspect	AI-led inspection verifies quality, quantity and condition against the contracted specification.
Insure	Insured logistics cover the goods in storage or in transit.
List	The asset is listed as a verified, priced, enforceable trade record.
Trade	The trade is executed and recorded on Maalexi's platform with blockchain security.
Fund	Institutional or non-institutional capital can be deployed against the trade.



THE MODEL: SIX STAGES TO A TRADABLE ASSET

Maalexi's answer was to digitise and coordinate the trust mechanisms of cross-border trade at the level of an individual shipment, rather than leaving each exporter to assemble them alone. Before Maalexi, an exporter's workflow was typically fragmented across brokers, WhatsApp, email, manual documents, separate inspections and repeated payment follow-up. On the platform, users are verified at onboarding, and every trade then moves through a structured sequence the company calls its Asset Transformation Engine, turning a shipment sitting in a warehouse into an asset that can be priced, traded, insured and financed.



EARNING THE BUYER'S CONFIDENCE

A buyer should not be expected to trust an unfamiliar exporter simply because that exporter has uploaded a listing, the founders argue. Confidence instead comes from independent evidence: who the supplier is, whether the goods exist and meet specification, whether documentation is authentic, and whether a clear contractual and payment framework exists if something goes wrong.

AI inspection captures physical and documentary evidence; quantity, packaging, condition, grading parameters, moisture, weight, photographs and lab results where required, at both source and destination, so the platform can compare the commodity's condition across the trade.

Where a genuine discrepancy shows up, the transaction moves into an exception workflow rather than leaving an algorithm to adjudicate: evidence is compared, independent reinspection can be commissioned, and contractual remedies — acceptance, price adjustment, replacement, an insurance claim or rejection — apply. Blockchain plays a narrower, more specific role on top of this: it does not prove that information entered was true, but it does make it detectable if a registered document or contract is altered afterward, which matters once several independent parties — buyer, seller, inspector, warehouse,

At a Glance	Maalexi
Founded	2021
Founders	Dr Azam Pasha (CEO), Rohit Majhi (CTO)
Headquarters	Wilmington, Delaware, USA
Operating hubs	Mumbai · Abu Dhabi · Dubai · Riyadh · New York
What it does	Risk-management and settlement platform for cross-border agri-trade
Platform scale	15M kg delivered · 4,100+ contracts executed · 99% execution success · 70% repeat customers
Offtake default rate	Under 1.33%, targeting below 0.25% in 2026
Latest funding	\$2.8M (June 2026, led by Tawuniya) · \$20M debt facility (2025)
Flagship	MAATEX — a regulated, tokenised real-world-asset exchange for agriculture

insurer, lender — are relying on the same transaction evidence.



FINANCING THE GAP: BOOK TO FUND

For many smaller agricultural exporters, the real comparison was never 50% financing against a larger bank facility; it was access to liquidity versus no liquidity at all. Traditional lenders have historically been cautious about lending against agri inventory because it is difficult to verify, value, monitor and liquidate at a distance.

Maalexi's Book to Fund option links financed inventory to real demand in its export markets: goods are verified against buyer and

WE DO NOT SIMPLY ASSESS WHETHER A COUNTERPARTY CAN DO THE OFFTAKE. WE ASSESS WHETHER THE ENTIRE TRANSACTION HAS A CREDIBLE PATH TO PERFORMANCE, SALE AND REPAYMENT



DR AZAM PASHA,
CO-FOUNDER AND CEO OF MAALEXI



THE CONSTRAINT IS NOT A LACK OF SUPPLY OR DEMAND. IT WAS THE ABILITY OF TWO SIDES TO TRUST EACH OTHER.

25+ years across global supply chains, financial markets and trade infrastructure. Has designed sovereign-level trade clusters for governments and institutions. Studied at Stanford, Wharton and Harvard, with doctoral research at SDA Bocconi.



ROHIT MAJHI,
CO-FOUNDER AND CTO OF MAALEXI



WE ARE NOT TRYING TO DISINTERMEDIATE RELATIONSHIPS. WE ARE TRYING TO DISINTERMEDIATE FRICTION

20+ years in digital, AI and supply-chain technology; built Maalexi's AI, IoT and blockchain stack. Earlier founded cloud-kitchen venture TrulyYum. B.E. in Electronics & Telecommunication; M.S. in Electrical & Electronics Engineering, University of Colorado Boulder.

THE WORKFLOW IS STANDARDIZED; THE SPECIFICATION IS COMMODITY-SPECIFIC. THAT ALLOWS US TO SCALE WITHOUT PRETENDING THAT EVERY AGRICULTURAL PRODUCT CAN BE INSPECTED IN THE SAME WAY

market requirements on entry to a nominated warehouse, monitored continuously, and held in sale-ready condition, so that once a purchase order is raised, the inventory is ready to move. That gives regulated financial institutions and NBFCs visibility not just into the collateral, but into its path to sale and repayment — improving the liquidity of the

RESULTS SO FAR

99%

Execution success rate, vs ~70% off-platform

<1.33%

Offtake default rate, targeting <0.25% in 2026

451

Agri-trade SMEs on the platform

70%

Return within 36 months

trade collateral and reducing the probability of principal loss. Maalexi itself does not lend or make credit decisions; eligible financing of up to 50% or more is independently assessed and provided by participating regulated institutions.



Level	What Maalexi Assesses
Counterparty	Financial, commercial and behavioural indicators, including the party's transaction and payment history on the platform
Transaction	Contractual performance, logistics milestones, documentation status and, where applicable, credit-insurance information
Commodity	Inspection data, product specifications and inventory visibility — and whether the goods stay commercially recoverable if something goes wrong

THE ROUTE TO MARKET: FCA OR DDP

Not every exporter should take the same route to a buyer, and Maalexi supports both. Selling FCA at origin lets an exporter complete its commercial obligation early, reducing logistics exposure and working-capital needs, but capturing less of the final value chain.

Taking the same product into a destination market and selling DDP captures more margin — the product sits closer to the buyer and can be sold in smaller quantities to multiple customers — but someone has to finance the inventory, freight, customs, warehousing and the risk of holding the commodity until it sells.



WINNING TRUST ON BOTH SIDES

The hardest part of onboarding a first-time exporter, the founders note, is rarely technology — documentation can be standardised and digital workflows taught. The bigger shift is moving from relationship-driven trading, where a price is quoted through a broker and a buyer is awaited, to evidence-driven, market-driven trading, where the product must be described precisely, the quantity credible, the specification verifiable and the price competitive against international alternatives. On the buyer side in the GCC and the US, that same evidence does the work a personal relationship once did: a verified business identity, product specification, inspection evidence and transaction documentation let a wholesaler evaluate the product and the transaction rather than a supplier they have never met — and repeated on-terms delivery moves confidence from individual relationships to the infrastructure itself. There was some early resistance from exporters used to trading through agents, but Maalexi is not trying to remove the agents and aggregators who add genuine value — only the friction and opacity around them.

Stage	What Happens
Inventory	Physical stock is registered — e.g. a 40' container of rice, grade 1121.
Inspect	AI-led inspection verifies quality, quantity and condition against the contracted specification.
Insure	Insured logistics cover the goods in storage or in transit.
List	The asset is listed as a verified, priced, enforceable trade record.
Trade	The trade is executed and recorded on Maalexi's platform with blockchain security.
Fund	Institutional or non-institutional capital can be deployed against the trade.

MAALEXI OFFERS GROUND-LEVEL DISTRIBUTION DEPTH AND INFRASTRUCTURE IN GCC AND EUROPE



Dimension	Traditional Agri-Lending	Maalexi's Book to Fund
Collateral verification	Relies on paper documentation and periodic audits	Goods verified against buyer/market requirements on warehouse entry
Ongoing monitoring	Limited visibility once inventory is pledged	Continuous monitoring keeps inventory in sale-ready condition
Path to repayment	Unclear how quickly collateral converts to cash	Inventory is demand-aligned — dispatch-ready once a purchase order is raised
Lender's role	Independent credit decision on limited information	Independent credit decision, made on verified, market-linked evidence



SCALING ACROSS COMMODITIES

With more than 135 product types on the platform — from rice and pulses to spices, edible oils, frozen meat and seafood — standardising inspection without slowing onboarding meant separating what is universal from what is commodity-specific. Supplier identity, origin, quantity, ownership, packaging, documentation, storage conditions and evidence of inspection apply to virtually every transaction; the quality parameters are then configured per commodity — variety, broken percentage and moisture for rice, purity,

THE BUYER DOES NOT NEED TO BLINDLY TRUST THE SELLER. THE BUYER NEEDS TO TRUST THE EVIDENCE, CONTROLS AND ACCOUNTABILITY SURROUNDING THE TRANSACTION

residues and microbiological limits for spices — on top of a common workflow. Accredited inspection agencies and laboratories provide the physical verification, and exceptions are escalated for human review.



MANAGING RISK AT THREE LEVELS

A 99% execution rate invites an obvious question: where do trades usually fail? Traditional trades tend to come undone through counterparty default, product disputes,

**RESILIENCE IN FOOD TRADE
INCREASINGLY MEANS HAVING
MULTIPLE ORIGINS CONNECTED
TO MULTIPLE DEMAND
MARKETS THROUGH THE SAME
TRUSTED INFRASTRUCTURE**

documentation discrepancies, missed delivery obligations or logistics disruption. The platform targets the informational and behavioural share of those failures; port closures, vessel delays, spoilage and genuine insolvency cannot be removed, only managed through monitoring, contractual allocation and insurance. The same logic shapes how Maalexi measures default. It reports an offtake default rate under 1.33%, targeting below 0.25% this year, and argues that a buyer can be financially

sound and a trade can still fail because quality parameters are non-compliant, documents are incomplete or inventory cannot be liquidated. So it assesses risk at three levels — and keeps monitoring after approval, watching whether inventory stays where it should be and whether a buyer's payment behaviour is deteriorating. Three years in, Maalexi reports 15 million kg of agri-food delivered and more than 4,100 contracts executed on its platform, with a 99% execution success rate against roughly 70% for trade conducted outside it.

Factor	Sell FCA at Origin	Sell DDP at Destination
Collateral verification	Relies on paper documentation and periodic audits	Goods verified against buyer/market requirements on warehouse entry
Ongoing monitoring	Limited visibility once inventory is pledged	Continuous monitoring keeps inventory in sale-ready condition
Path to repayment	Unclear how quickly collateral converts to cash	Inventory is demand-aligned — dispatch-ready once a purchase order is raised
Lender's role	Independent credit decision on limited information	Independent credit decision, made on verified, market-linked evidence

Layer	What is Checked
Universal controls	Supplier identity, product origin, quantity, ownership or allocation, packaging, documentation, storage conditions and evidence of inspection
Rice	Variety, broken percentage, moisture and grain characteristics
Spices	Purity, residues, colour and microbiological requirements
Nuts, oils, seafood, frozen proteins	Each carries its own specifications and testing requirements, verified by accredited inspection agencies and laboratories

The company credits verified onboarding, inspection records and digitally executed contracts for cutting disputes over what was agreed, shipped and performed.



WHAT'S NEXT

Maalexi sees less a wholesale shift away from any one corridor than a push by exporters to avoid dependence on a single market, buyer or route, as recent years have shown how quickly freight, tariffs and regulation can change. The GCC remains the anchor, given its structural food-import dependence and large SME distribution base; Europe and the US add demand at a higher regulatory bar. Warehousing follows that demand, while the origin base expands so buyers, too, are not dependent on a single country. The next step is MAATEX — the Maalexi Agricultural Assets Token Exchange — which the company



MAALEXI CREATES VERIFIED, DEMAND-ALIGNED, SALE-READY TRADE ASSETS THAT GLOBAL BUYERS SEEK TO BUY; REGULATED LENDERS DECIDE WHETHER AND ON WHAT TERMS TO FINANCE THEM

describes as the world's first regulated public real-world-asset exchange for agriculture: tokenised commodities, backed by verified physical stock, settled on-chain in real time, aimed at channelling institutional capital into agricultural supply chains.

That ambition has drawn a growing ecosystem behind it: an oversubscribed \$2.8 million round in June 2026 led by Saudi insurer Tawuniya with Global Ventures, earlier backing from Y Combinator and Cantos Ventures, a reported \$20 million debt facility from August 2025, and partners spanning Citi, Allianz Trade, Avalanche, DP World, Coface, CRIF and GSBN. 

KEY TAKEAWAYS

Lesson	In Practice
Verify the asset, not just the party	Inspection, monitoring and registered records make a commodity checkable at a distance — and so priceable, insurable and financeable.
Build infrastructure, not a balance sheet	Maalexi does not lend; regulated institutions and NBFCs independently decide whether and on what terms to fund verified trades.
Link payment to milestones, not trust	Inspection, warehouse receipt, bill of lading, arrival or delivery can trigger payment, depending on the deal structure.
Standardise the workflow, specialise the specification	Commodity-specific inspection templates on a common architecture let 135+ products scale.
Remove friction, keep relationships	Agents and aggregators who add genuine value stay in the ecosystem; opacity and unnecessary steps are what go.

Corridor	Indian Agri-Exports	5-Yr CAGR	Maalexi Footprint
GCC	~\$7B	11%	Destination warehousing: Dubai, Riyadh, Jeddah
Europe	~\$8B	12%	Rotterdam, Antwerp, Hamburg (coming soon)
North America	~\$5B	—	Buyer demand; no warehouse node listed
India (origin)	~\$50B total	—	Mundra, Baroda, Mumbai, Kochi, Tughlakabad; Santos, Brazil (coming soon)

Source: Maalexi business brief (2026). The founders also cite the US as a high-margin corridor.





Beyond Mining

Odisha's Blueprint for Industrial Diversification

Hemant Sharma, IAS, Additional Chief Secretary (Industries & IPR) and Chairman, IPICOL, Government of Odisha, answers on the state's shift from a mineral-dependent economy to a technology-driven, clean-energy hub.

Odisha's industrial story is being rewritten at speed. From a state once defined almost entirely by its mineral wealth, it is now positioning itself as a diversified hub for green energy, petrochemicals, electronics, textiles and food processing, while pushing that growth into every one of its 30 districts. At the Smart Logistics Summit & Awards 2026 in Bhubaneswar, and in this interview with Maritime Gateway, Hemant Sharma, IAS, Additional Chief Secretary, Industries & IPR, and Chairman, IPICOL, lays out how the state is using policy reform, digital single-window systems and anchor investments to convert investor intent into grounded projects, and what that means for logistics, supply chain and warehousing demand across the state.

How do you see Odisha's industrial mix evolving beyond its traditional strengths in metals and mining into sectors like green energy, petrochemicals, electronics and semiconductors?

Odisha is undergoing a structural economic shift, deliberately transitioning from a mineral-dependent economy to a high-technology and clean energy hub. The state's investment profile reflects this; out of the recent

W25,000 crore grounded investments, approximately ₹20,000 crore is directed toward diversified, non-metallurgical sectors such as chemicals, petrochemicals, recycling, engineering and precision manufacturing. To aggressively capture the technology and hardware markets, Odisha has implemented the Pharmaceutical and Medical Devices Policy 2025 and the Electronics Component Manufacturing Policy 2025, which directly support India's Semiconductor Mission through capital subsidies and pre-allotted land parcels. Furthermore, large-scale clean energy pipelines, including significant green hydrogen projects by ACME and Avaada at the Gopalpur Special Economic Zone (SEZ), are altering the industrial matrix. Our primary target is to convert at least ₹5 lakh crore of investment proposals into tangible, grounded projects by March 2026, ensuring that the future growth engine of Odisha is built on high-value, tech-driven and green industries.



HEMANT SHARMA, IAS,
ADDITIONAL CHIEF SECRETARY (INDUSTRIES & IPR) AND
CHAIRMAN, IPICOL, GOVERNMENT OF ODISHA

What steps are underway to push manufacturing and MSME activity beyond central Odisha, so every district builds its own industrial and MSME park ecosystem?

The state government is addressing regional economic imbalances through a mandated policy of industrial decentralisation. Currently,

meaningful industrial activity is concentrated across roughly eight districts, but the administration has set a hard target to spread functional manufacturing ecosystems into all 30 districts by 2029. To execute this, the Odisha Industrial Infrastructure Development Corporation (IDCO) is actively acquiring and preparing plug-and-play land banks to set up micro, small and medium industrial clusters in rural areas.

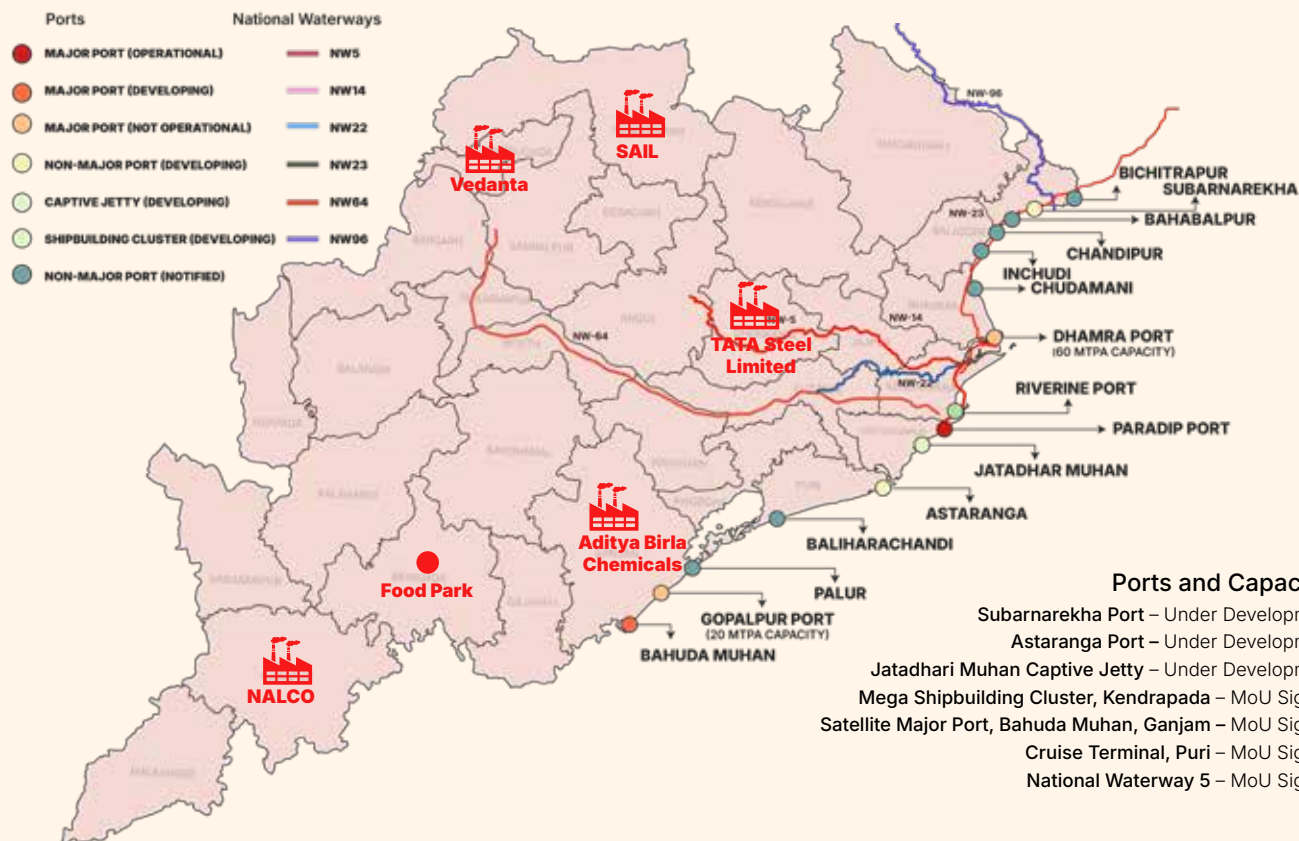
Infrastructure expansion is being closely aligned with crucial logistics routes, notably the Western Odisha Expressway and the upcoming Raipur-Rourkela-Ranchi (RRR) industrial corridor. These localised parks are financially backed by the state's Industrial Infrastructure Development Fund (IIDF),



ODISHA'S PRIMARY COMPETITIVE ADVANTAGE OVER TRADITIONAL INDUSTRIAL STATES IS OUR ABSOLUTE INSTITUTIONAL ALIGNMENT AND POLICY PREDICTABILITY

COASTAL GATEWAY WITH STRATEGIC PORTS

575 Km Coastline | 6 Coastal Districts | 1 Major Port | 2 Non-Major Ports



which subsidises essential utilities like dedicated power lines and water supply, lowering the entry barriers for local entrepreneurs and guaranteeing inclusive job creation.

How are you positioning Odisha as a fresh destination for textiles, food processing and other job-intensive industries, and tapping into the skilled Odia workforce already at work across India's major industrial centres?

Odisha is prioritising high-employment-elasticity sectors like textiles, apparel and food processing by designating them as core "Thrust Sectors" under our industrial policy framework. To trigger massive job creation, the state offers structured fiscal incentives, including premium land at concessional rates for

manufacturing units that employ more than 200 to 1,000 Odisha-domiciled skilled workers. Mega investments such as Epic Group (Trimetro Garments), SAPL, the apparel production unit at Khordha, Page Industries at Cuttack, and the Varun Beverages soft drink processing unit at Khordha, among others, and upcoming national brands, which create direct employment for thousands of rural women, prove the viability of this strategy.

Crucially, the government is mapping the database of skilled Odia migrant workers currently stationed in textile hubs like Surat, Tiruppur and Bengaluru. By providing high-quality domestic infrastructure and port-led logistics networks at Paradip Port, Gopalpur and Dhamra, we are successfully incentivising national

manufacturers to establish factories right here in Odisha, creating a clear pathway for our skilled diaspora to return home.

How are reforms like GO-EAST, GO-SWIFT 2.0 and the updated Industrial Policy Resolution changing the investor experience, from land allotment to approvals, and shortening the timeline from intent to commissioning?

The state's administrative machinery has undergone a total digital overhaul to drastically optimise the ease of doing business for corporate investors. Upgrades rolled out via the GO-SWIFT 2.0 single-window platform enable seamless, end-to-end processing and automated tracking of over 34 critical Government-to-Business



ODISHA HAS SHORTENED THE AVERAGE TIMELINE FROM AN INVESTMENT 'INTENT' TO PHYSICAL GROUND-BREAKING DOWN TO UNDER 180 DAYS.

(G2B) services across 15 distinct state departments. Land procurement has been entirely demystified through the GO-PLUS GIS application, which acts as a virtual supermarket for industrial land, allowing foreign and domestic firms to evaluate and select encumbrance-free plots instantly. Concurrently, the synchronised GO-SMILE



FOR EVERY DIRECT JOB GENERATED WITHIN THESE MEGA ANCHOR UNITS, APPROXIMATELY 3.5 INDIRECT JOBS ARE CREATED WITHIN THE LOCAL MSME AND SUPPLY CHAIN ECOSYSTEM

inspection portal eliminates arbitrary regulatory friction by replacing random physical agency audits with a unified, transparent compliance framework. By combining these digital systems with 100% stamp duty and registration exemptions on priority land allotments, Odisha has shortened the average timeline from an investment ‘Intent’ to physical ground-breaking down to under 180 days.

How are you encouraging greater value addition in mining and resource-based manufacturing while pushing industries toward more sustainable technologies and higher renewable energy use?
While Odisha holds an ironclad position as India’s leading producer of metallic minerals, the current policy strictly

discourages raw mineral exports in favour of mandatory domestic value addition. Our objective is to process ores entirely within the state’s borders, steering heavy industry toward long-term environmental sustainability. Under current energy directives, heavy industrial units consuming renewable power receive a 100% exemption on Electricity Duty for 20 years, alongside a full reimbursement of state transmission and wheeling charges for captive clean energy consumption.

Furthermore, the state provides capital assistance of up to ₹10 crore per unit for the adoption of green technologies, carbon-mitigation equipment and circular economic practices like Zero Liquid Discharge (ZLD) systems. These mechanisms are aggressively driving the decarbonisation of our core metal industries, aligning them with global Environmental, Social and Governance (ESG) standards while protecting the state’s natural ecology.

What’s your strategy for using anchor projects, including landmark FDI in mining and metallurgy, to catalyse downstream industries, employment and technology transfer across the state?

The state’s core strategy relies on leveraging multi-billion-dollar anchor investments to cultivate massive local downstream engineering and ancillary

Incentives for Priority and Thrust Sector Units

Incentive	Priority sector	Thrust sector*
Capital investment subsidy	20%, no upper cap	30%, no upper cap
Electricity duty exemption	100%, 7 years	100%, 10 years
Power tariff reimbursement	₹2 per unit	₹2 per unit
ESI / EPF reimbursement	100%, 7 years	100%, 10 years
Net SGST reimbursement	100%, up to 200%–300% of plant & machinery cost	100%, up to 200%–300% of plant & machinery cost

Source: Government of Odisha, Smart Logistics Summit & Awards 2026. *Thrust Sector covers logistics and warehousing units in industrially backward districts employing more than 200 people; capital subsidy disbursed over five years.

clusters. Major projects such as AM/NS India’s mega steel plant in Kendrapara and JSW’s integrated steel and electric vehicle (EV) manufacturing facilities act as primary economic multipliers. For every direct job generated within these mega anchor units, approximately 3.5 indirect jobs are created within the local MSME and supply chain ecosystem. To enforce technology transfer and upgrade local human capital, the state mandates that these large-scale FDI and domestic projects partner with premier local technical institutes like IIT Bhubaneswar, NIT Rourkela and IIIT. This ensures that global manufacturing practices and precision engineering technologies are absorbed directly into our local workforce, creating an independent, self-sustaining industrial economy.

How does alignment across departments, from industrial planning to digital single-window systems, help Odisha compete as an agile industrial hub against established manufacturing regions?
Odisha’s primary competitive advantage over traditional industrial states is our absolute institutional alignment and policy predictability. This inter-departmental synergy recently earned Odisha recognition as one of the Top Large States

in NITI Aayog’s Investment Friendliness Index. Through a unified governance model, the High-Level Clearance Authority (HLCA) bridges the Industries Department directly with Energy, Water Resources, Forest and Finance departments, allowing the state to clear massive multi-sector projects in single, coordinated sittings. This tight alignment eliminates the bureaucratic delays that plague other regions, ensuring that when industrial land is allocated, utility trunk infrastructure such as power grids, water lines and dedicated port connectivity is delivered to the site simultaneously.

Odisha’s Industrial Push: at a Glance

₹5L CR

Investment target, Mar 2026

180 DAYS

Intent to ground-breaking

30

Districts targeted by 2029

3.5X

Indirect jobs per anchor job

52.4/100

NITI Aayog investor-friendliness score

ODISHA’S MINERAL LEADERSHIP

Mineral	India rank	Share of India’s deposits
Chromite	#1	96%
Nickel	#1	92%
Bauxite	#1	53%
Manganese	#1	45%
Iron ore	#1	35%
Coal	#2	25%

Source: Government of Odisha, Smart Logistics Summit & Awards 2026. Odisha’s policy now discourages raw ore exports in favour of in-state value addition (Q5).

HEARTLAND, PORT-BOUND

Madhya Pradesh has no coastline, yet exports nearing ₹69,000 crore and a direct rail link to JNPA are making it one of India's most important port hinterlands. The next step is turning new inland infrastructure into faster, more predictable and commercially competitive access to the sea.

A container leaving a pharmaceutical, engineering or food-processing unit in Madhya Pradesh may be hundreds of kilometres from the sea. Whether it catches its vessel depends on far more than distance: an empty container, a dependable first-mile link, an inland terminal, customs clearance, a timely rail departure and enough buffer to meet the port cut-off

That chain matters more as the export base grows. According to FIEO-compiled data, the state's merchandise exports reached ₹68,837.01 crore in FY2025-26, up from ₹66,220.14 crore a year earlier, placing it 13th among Indian states with 1.76% of national exports. The longer arc is steeper still: state government figures put exports at ₹37,692 crore in FY2019-20, so the export base has grown by more than 80% in six years.

The basket is diversifying. Drug formulations and biologicals account for 19.19% of exports,

and pharmaceutical exports rose 3.51% to \$663.55 million. Engineering goods, cotton fabrics and yarn, rice, oil meals and construction machinery add depth. State data for FY2024-25 shows pharmaceuticals leading by value, followed by animal feed, machinery, aluminium and textiles, with the United States the largest buyer of pharmaceuticals and machinery. Each product brings its own logistics need: controlled conditions for pharma, cold chain for agri-food, and dependable container supply and sailings for manufactured goods.

Where the cargo originates

Exports are concentrated in the west. Dhar alone contributed 35.92% in FY2025-26, followed by Indore (12.45%) and Raizen (11.21%). The top 10 districts together account for nearly 88%. In value terms, Dhar shipped ₹17,830 crore and Indore ₹13,500 crore in FY2024-25.

That places Dhar, Indore and the Pithampur industrial belt at

Infrastructure arriving at different speeds

Status	Project	What it means
Operational	Powarkheda-Nhava Sheva EXIM rail	Twice-weekly direct link to JNPA
Under development	Pithampur MMLP	Multimodal cargo and warehousing hub
Approved	NH-347B upgrade	Stronger road links to logistics nodes
Future	Wider freight-rail connectivity	Added long-haul cargo capacity

the centre of the state's maritime opportunity, with Nhava Sheva, ICD Mandideep and ICD Pithampur among the principal export routes. A second cluster is taking shape around Bhopal, Mandideep, Raizen and Narmadapuram, where pharmaceutical, food and engineering units sit within reach of new rail capacity. The question is no longer whether Madhya Pradesh is connected, but how efficiently a container moves from factory gate to JNPA.

Pithampur: the next multimodal hub

Pithampur's automotive, engineering, pharmaceutical and apparel base generates steady port-bound cargo. The nearby Indore Multi-Modal Logistics Park, spread across 255.17 acres at an estimated ₹1,110.58 crore,

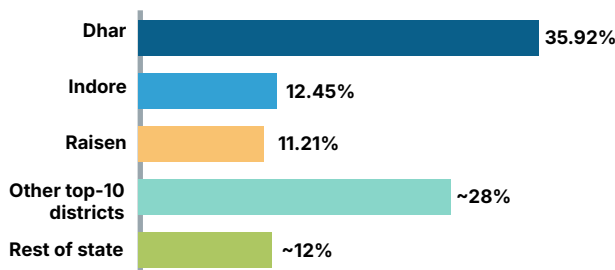
has been awarded under a PPP/DBFOT model to G R Infraprojects on a 45-year concession, with the developer investing ₹758.10 crore.

The park will integrate road, rail and warehousing alongside the Indore-Tihi-Dahod rail line, with a 6.5-km rail siding from Sagore station and four-lane highway access. Located about 30 km from Indore city and its airport, it is designed to serve industrial zones across Indore, Ujjain, Dewas, Dhar, Khandwa and Barwani. Its full value will come from frequent, dependable rail services beyond the park's boundary.

Powarkheda brings rail into play

DP World is developing an 88.3-acre rail-centric inland logistics

District share of MP exports, FY2025-26



Source: FIEO. 'Other top-10' and 'Rest of state' are approximate, derived from the ~88% top-10 share.

Powarkheda at a Glance

Site	88.3 acres, rail-centric inland hub
Rail service	Twice weekly to Nhava Sheva, scaling towards daily
Rail capacity	1,400+ TEUs a month
Transit to port	About three days
Versus road	30-40% faster; ~70% lower emissions

Source: DP World.



hub at Powarkheda, with an inland container yard, EXIM rail connectivity, warehousing, cold storage and container services. Its twice-weekly EXIM rail service to Nhava Sheva began in December 2025, and the company expects to scale towards daily departures as demand builds. The service draws cargo from the Mandideep, Bhopal, Itarsi, Narmadapuram, Pipariya, Raisen and Sehore belts, and the site adds container repair and bonded logistics for agri-processing, chemicals, food, steel and textile shippers.

DP World estimates that rail could cut transit time to JNPA by 30–40% compared with road, and emissions by nearly 70%. Operating data on frequen-

cy, schedule reliability and on-time port arrivals will be the benchmark to watch. Road capacity is also growing. The **NH-347B upgrade**, approved in June 2026, covers 233.653 km at ₹4,415.60 crore on the Betul–Khandwa–Vadodara corridor, widening sections across Betul, Khandwa, Khargone and Barwani. Built under the hybrid annuity mode, it upgrades 125.01 km to two lanes with paved shoulders and widens 108.643 km from two to four lanes, linking six PM Gati Shakti economic nodes, including textile clusters and food parks, as well as the Indore MMLP.

Policy support for private capacity
The state's Logistics Policy 2025

MP Logistics Policy 2025: Key Incentives

Support	Ceiling
Logistics parks, 25–75 acres	Powarkheda–Nhava Sheva EXIM rail
Logistics parks, above 75 acres	Pithampur MMLP
External road and rail links	NH-347B upgrade
Stamp duty and registration	Wider freight-rail connectivity
Operations	24×7 permission; up to 70% ground coverage

Source: Government of Madhya Pradesh.

aims to bring the sector in line with global benchmarks by 2030 while lowering logistics costs and deepening multimodal links. DPIIT's LEADS 2025 rates Madhya Pradesh an 'Accelerator', a state showing notable improvement momentum and a clear reform orientation.

The port connection is the measure

For maritime stakeholders, the story returns to the inland-to-port chain. Exporters will weigh how often they can secure a train, how easily empties are positioned, whether customs can be completed inland and how much buffer each vessel cut-off demands. With Gujarat's ports also competing for central Indian cargo, door-to-port cost, transit time and service frequency will decide where the boxes flow.

From infrastructure to performance

At nearly ₹69,000 crore of

DP World estimates that rail could cut transit time to JNPA by 30–40% compared with road, and emissions by nearly 70%

annual exports, Madhya Pradesh is large enough for logistics performance to shape the competitiveness of its manufacturers. With an operating rail link to Nhava Sheva, a major MMLP under development, new road capacity approved and a policy framework that rewards private investment, the building blocks are in place. Madhya Pradesh may never have a coastline. It does not need one. If its inland network delivers fast, predictable port access, the state's central location will become a genuine competitive advantage. **MP**

MP | Key Numbers

Indicator	Latest figure
Merchandise exports, FY2025-26	₹68,837.01 crore
Share of India's exports / rank	1.76% / 13th
Drug formulations & biologicals	19.19% of exports
Pharmaceutical exports	\$663.55 million
Top three districts (Dhar, Indore, Raisen)	59.58% of exports
Powarkheda hub / rail service	88.3 acres / twice weekly
Pithampur MMLP	255.17 acres / ₹1,110.58 crore
NH-347B upgrade	233.653 km / ₹4,415.60 crore
LEADS 2025 category	Accelerator

Sources: Federation of Indian Export Organisations (FIEO); Times of India/FIEO FY2025-26 export data; Government of Madhya Pradesh; DP World; Ministry of Road Transport & Highways/PIB; NHLM/PIB; DPIIT LEADS 2025.



INDIA'S STEEL SECTOR

DEMAND GROWTH AMID IMPORT PRESSURE

Maritime Gateway Research Bureau

India's steel industry entered the second half of FY27 on a note of cautious strength, marked by steady domestic production, rising consumption, and a notable uptick in imports that is reshaping the competitive landscape. Data from September 2026 paints a picture of an industry adapting to seasonal softness, cost pressures, and a widening gap between what India produces and what it consumes.

Port Traffic: A Modest Pullback

Steel and steel products traffic at Indian ports during April–August FY27 stood at 5.27 million metric tonnes (MMT), a slight decline

from 5.37 MMT recorded during the same period a year earlier. While the overall volume dipped marginally, the composition of that traffic tells a more detailed story.

Mumbai remained India's busiest port for steel cargo, handling 1.38 MMT during the five-month period, just below the 1.47 MMT it managed a year earlier. Mundra port, by contrast, posted a strong gain, handling 0.74 MMT compared to 0.45 MMT previously, a jump that reflects its growing role as a western gateway for steel trade. Paradip also saw a decline, moving 0.72 MMT versus 1.07 MMT a year ago, while Kandla bucked the broader trend with a rise to 0.41 MMT from

0.54 MMT the year before actually showing the reverse. Smaller ports such as Chennai, Mormugao, Dhamra, Visakhapatnam, Ennore, and Magdalla each handled between 0.15 and 0.47 MMT, with mixed year-on-year movements across the board.

On the trade balance side, India's export volumes of steel and steel products rose sharply to 2.30 MMT in April–August FY27, up from a much smaller base the previous year. Mumbai again led as the top export hub, moving 0.50 MMT. Imports, meanwhile, declined slightly to 2.32 MMT for the same period, with Mumbai also topping the import charts at 0.88 MMT. This suggests that while

India's export destinations were led by Italy, which took in 0.53 MMT of Indian steel, followed by Singapore at 0.39 MMT. Vietnam and the United Kingdom each absorbed 0.16 MMT, while Belgium, the UAE, the United States, South Africa, the Netherlands, and Bulgaria made up the balance of top destinations

India remains a significant importer of steel by volume, the pace of import growth at ports has moderated even as exports have gained momentum.

What's Moving Through the Ports?

A closer look at product-level traffic clarifies where the volumes are concentrated. Steel coils dominated the mix, accounting for 1.67 MMT of total port traffic during the period by far the largest single category. Within that, coils were also the top imported product at 0.93 MMT and the top exported product at 0.55 MMT, underlining their central role in both directions of trade.

Hot-rolled (H.R.) coils followed at 0.94 MMT, with steel slab at 0.63 MMT and generic "steel" cargo at 0.47 MMT rounding out the top categories. Steel plates (0.35 MMT), steel pipes (0.34 MMT), cold-rolled (C.R.) coils (0.24 MMT), steel billets (0.16 MMT), and steel bars (0.09 MMT) made up the remainder of the top ten products.

On the import side, South Korea was India's largest source of steel, supplying 0.66 MMT during the period, followed by China at 0.31 MMT and Japan at 0.27 MMT. Vietnam (0.17 MMT) and Indonesia (0.16 MMT) rounded out the top five import origins, with smaller volumes arriving from Russia, Taiwan, Chile, Malaysia, and Belgium. India's export destinations were led by Italy, which took in 0.53 MMT of Indian steel, followed by Singapore at 0.39 MMT. Vietnam and the United Kingdom each absorbed 0.16 MMT, while Belgium, the UAE, the United States, South Africa, the Netherlands, and Bulgaria made up the balance of top destinations.

Production and Demand: A Widening Gap

The headline story for August 2026 was one of flat production against rising demand. National crude steel output dipped marginally by 0.1% y-o-y to 14.1 MT, while hot metal production slipped 1.1% to 8.0 MT. In contrast, finished steel consumption climbed 3.9% y-o-y to 14.3 MT a gap that emerged during what is typically a monsoon-softened period for the industry. This supply-demand mismatch has had a clear knock-on effect on trade flows. Higher infrastructure-driven demand pushed finished steel imports up 8% y-o-y in August alone, to 721,100 tonnes, and a striking 29.5% higher on a cumulative April-August basis, reaching 3.48 MT.

The result is that India has continued to run as a net importer of steel by volume, even as domestic producers ramp up capacity. The imbalance has also shown up in pricing. Hot-rolled coil (HRC) prices surged to multi-year highs between August and early September, rising by roughly ₹4,000 per tonne. Several factors converged to drive this: lean inventories held by distributors, a pickup in vehicle and construction activity as the monsoon receded, and higher costs for imported coking coal, a critical input for blast-furnace steelmaking.

Operational Highlights Across the Industry

Individual producers delivered a mixed but generally positive set of results in August. State-owned Steel Authority of India (SAIL) posted its best-ever August output, with crude steel production rising 8% y-o-y to 1.68 MT and hot metal output growing 9% to 1.78 MT. The company also reported strong commercial momentum, with sales volumes up 13% y-o-y to 1.87 MT and cash collections jumping 23%. SAIL used this financial strength to cut net borrowings by ₹870 crore, while also increasing long-rail supplies to Indian Railways by 11%, to 1.12 lakh tonnes.

In the private sector, JSW Steel reported consolidated crude steel output up 3% y-o-y to 2.46 MT in August, with its Indian plants running at 88% capacity utilisation. The company is pursuing an ambitious long-term expansion plan, aiming to scale total capacity from 37.9 million tonnes per annum (MTPA) to 54.8 MTPA over the next four years. Central to this plan is the expansion of its flagship Vijayanagar plant to 25 MTPA by FY30. Upstream, raw material suppliers also posted gains. NMDC, India's largest iron ore

miner, recorded a 20.8% y-o-y surge in iron ore production to 4.07 MT in August. The company also commissioned the Indurating Machine at its 2 MTPA Nagarnar Pellet Plant, enabling it to process green pellets into high-strength feed for steelmaking. In the secondary steel segment, Steel Exchange India (SEIL) achieved its highest-ever monthly re-bar output at 24,824 MT, following the commissioning of a new Reheating Furnace that lifted its monthly re-bar production capacity by approximately 27%.

Green Steel and Policy Developments

Decarbonisation efforts also featured prominently in the month's developments. SAIL launched a daily CO₂ emission-monitoring dashboard across its Bhilai Steel Plant and Chandrapur Ferro Alloy Plant, aimed at tracking carbon intensity more closely as the industry faces growing pressure to reduce its environmental footprint. On the research front, India's Steel Research and Technology Mission of India (SRTMI) signed a memorandum of understanding with Sweden's SWERIM to collaborate on green steel technologies, scrap circularity, and the application of AI and machine learning to low-carbon steelmaking processes.

Outlook for H2 FY27

Looking ahead, industry watchers project volume-led growth of up to 9% for the full fiscal year, supported by a post-monsoon pickup in construction, automotive manufacturing, and capital infrastructure spending. Margins are also expected to see some relief as coking coal import costs soften and seasonal maintenance shutdowns normalise across plants.

That said, the sector continues to face a persistent structural risk: cheap steel imports, particularly from China, remain a concern for domestic pricing power. Indian mills will need to continue leaning on strong domestic demand and the existing 12% safeguard duty to protect margins as global steel trade dynamics evolve.

Taken together, the September 2026 data suggests an Indian steel industry that is fundamentally healthy with record output from major players like SAIL, aggressive capacity expansion from JSW, and rising raw material production from NMDC but one that remains exposed to import competition and price volatility as it navigates the second half of the fiscal year. 



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