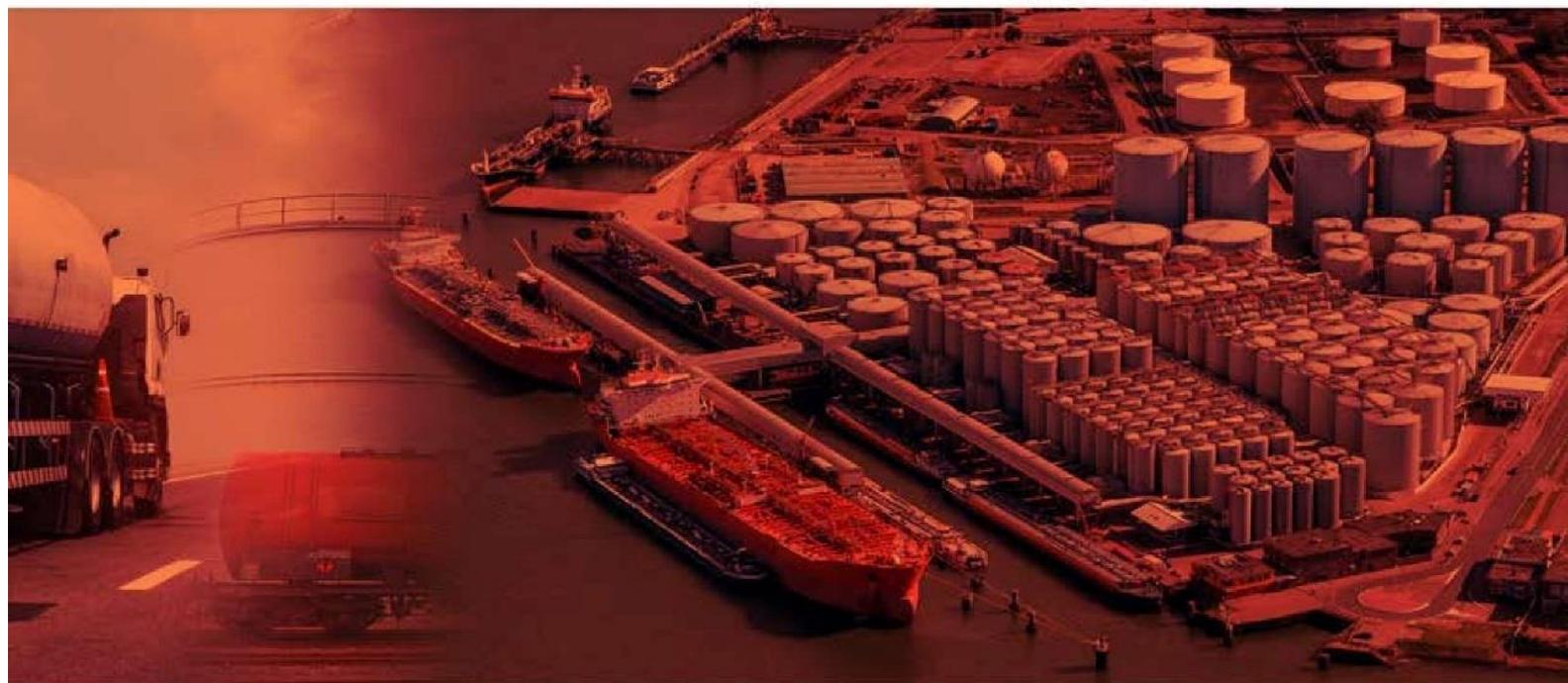


# *Liquid bulk storage in India*

## An industry view

March 2019



**Knowledge Partners**



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# Foreword



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**Partner and Oil and Gas  
Leader, PwC India**

The success of Indian businesses is strongly linked to capacity and efficiency of the logistics sector. As a result, the sector is attracting attention and remains one with a significant investment potential in the country<sup>1</sup>.

Efficient management of the connections between production centres and markets ensures that supply is not disrupted. Therefore, perfecting the supply chain using all possible means becomes imperative. The advent of new technologies in digitization and automation have further challenged the operators with a need to change.

Government policy initiatives like ‘Make in India’; the implementation of GST, a nation-wide uniform indirect tax system; and big-ticket projects like Sagarmala and Bharatmala offer the potential to transform India into an efficient, integrated and buoyant economy built on forward-looking and future-thinking infrastructure investments. The logistics industry would be a key enabler and facilitator on this journey of achieving the growth potential of a fast-paced economy like India. With better stakeholder coordination, increased infrastructure investment and improved operational efficiency, we can realise a unique growth story.

PwC is proud to be the knowledge partner for the ‘Indian Bulk Liquid Storage Summit’ organised by Messe Frankfurt. At the summit, diverse stakeholder groups, including policymakers, transport and terminal infrastructure service providers, and logistics service providers (LSPs) will deliberate on issues impacting the sector. The discussions will focus on three themes: the primacy of end-to-end logistics integration, how our country’s coastal and internal waterways can be strengthened, the role and impact of digitisation and the efficacy of a comprehensive National Logistics Policy on bulk liquid storage and the logistics industry in general.

This paper is meant to serve as the background to the deliberations at the summit. Apart from exploring the themes mentioned above, it provides the industry view on the status and prospects of the sector with regard to infrastructure development, adoption of digital solutions, availability of skilled labour, and performance and safety standards, and explores regulatory gaps that continue to affect the performance of the logistics industry. In addition, the paper focuses on how an integrated end-to-end logistics network with the required infrastructure facilities and a digital and services platform can lead to improved efficiency.

The paper highlights industry leaders’ opinions on the possible way forward and how a digital revolution, namely new technologies such as the Internet of things, are being used by the bulk liquid storage sector to streamline processes and ensure a smoother interface. It also presents suggestions from the industry on possible areas that the government may focus on as well as areas where private players may want to enter to serve a host of consumers.

We hope that this paper facilitates discussion among policymakers and industry players on how to revitalise India’s bulk liquid storage industry and enhance its contribution to the economic growth potential of the country.

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<sup>1</sup> NITI Aayog, IBEF

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# Bulk Storage In India: A view on the market



**Mr. Vivek Venkatachalam**

Managing Director,  
Indian Oiltanking Ltd

Mr Vivek has over two decades of experience in the Oil and Gas industry. Comprising of a wide array of assignments and spear heading multiple projects. Mr Vivek has headed multinational giants such as GE Oil and Gas and GE Power Conversion India as a Chief Executive Officer. Currently, Mr Vivek is the Managing Director of Indian Oiltanking Ltd., a technical and logistics solutions provider with domain expertise in Engineering Procurement & Construction (EPC), Terminalling, Services and Renewable Energy.

## *1.1. Can you please elaborate on IOTL's Business and its Tankage capabilities?*

IOT Infrastructure & Energy Services Limited (IOT) is a technical and logistics solutions provider with domain expertise in Engineering Procurement & Construction (EPC), Terminalling, Services and Renewable Energy. Since our inception in 1997, we have combined the strength and reputation of our parent companies – Indian Oil Corporation Limited (IOC), and Oiltanking GmbH, Germany – to provide customers with unparalleled logistics services and technical solutions in the Oil and Gas industry.

IOTL's vast terminal infrastructure is located across the country, offering internationally benchmarked standards in all operations. Our successful handling of crude, petroleum products and bulk LPG gas has made us the preferred storage provider for this sector. World-class automation, active fire protection measures along with stringent Health, Safety, Security and Environment (HSSE) control management makes us a vendor of choice for our customers.

Following are our key projects that highlight our Terminalling business:

**Mumbai:** India's first truly independent terminal that handles the oil industry's requirement for export and coastal movement, located at Navghar:

- 254,680 KL; 17 Tanks
- 13kms 2x24" jetty lines

**Goa:** A Terminal that plays a critical role in distribution of petroleum products across the State:

- 77,035 KL capacity; 9 Tanks
- 14kms, 20" Jetty Line

**Chennai:** A Bulk LPG and Bottling facilities to handle and bottle the entire LPG produced by a leading refinery:

- Bulk LPG Storage and Automated Loading Facilities
- Pipeline link to Refinery
- 4 x 1200 MT Mounded Storage Vessels

**Paradeep:** India's first Integrated Refinery Crude and Product Tankfarm:

- Storage tanks – Total capacity – 1,410,435 KL.

**Raipur:** India's first In-land Common User Terminal for two leading Public Sector Oil Companies.

- 19 Overground and 2 Underground tanks
- Handles Gasoil, Gasoline, Kerosene.

## *1.2. What is your view on the Bulk Liquids Sector in India and its future?*

India presents a growing market for bulk liquids led by petroleum products, petrochemicals and chemicals. India being a consumption market, there is significant infrastructure spending that is going to take place in India primarily led by the Oil Marketing Companies. The policy initiatives by the government on the upstream, midstream and downstream sector are further positioned to enhance India's energy outlook.

Oil refining companies have lined up their refinery expansion plans and are also setting up huge petrochemical complexes. This shall further give a boost to the chemical and petrochemical market. With oil continuing to play a dominant role in India's energy basket, the National Oil Companies have sharpened their focus on significantly expanding their distribution infrastructure and thereby driving investments. International oil players have also partnered with Indian private oil companies to fast-track their plans to penetrate the Indian energy market.

The per capita energy consumption still being only at about one-third of the world average, India presents a very attractive energy growth market. The rapid pace of urbanization and increasing disposable income among the middle class along with government's strong focus on infrastructure development, the energy requirement of the country is set to witness an exponential growth.

Besides the oil price uncertainty which has a global impact, constrained port capacities, inadequate inland logistics, low penetration of coastal shipping & inland waterways, land acquisition and the regulatory processes for obtaining statutory approvals & clearances appear to be the major challenges for the industry. A number of initiatives both public & private need to be undertaken to improve and excel on these parameters. Promoting the development of common infrastructure and inclusion of petroleum products into GST shall further bolster the competitiveness and bring in efficiency in India's energy sector.

### *1.3. What initiatives has IOTL taken and in your opinion other industry players can take to improve operational excellence?*

In today's world of technology and digitalization there can be a wide a range of initiatives an organization can take to improve its operational excellence, namely:

**e-Learning:** In order to build domain expertise, a Basic Operator Training (BOT) programme containing e-modules for training on various topics related to Industry basics, HSSE and Operations can be launched.

**FMECA (Failure Mode Effect and Cause Analysis):** The objective of the project is to ensure that all the assets within a terminal are maintained efficiently using a standard process involving a risk based approach.

**Alarm Management:** As control rooms become the centre of all operational activities of terminals. The alarm philosophy establishes the basic definitions, principles and processes for the design, implementation, maintenance and management of Alarm Systems.

#### **HSSE Related**

IOT firmly believes that all its employees and workers arrive home safely at the end of the day. Employees are focused on achieving a more mature interdependent safety culture where they are responsible and supported to self-manage decisions and actions that have HSSE consequences.

**STEP-UP** is a behaviour based HSSE program. This is an on-going program focussed on improving (a) Compliance (b) Method Statement (c) Competence and (d) Behaviour. As a part of the program, a Gap Analysis on Safety Management Systems and a Safety Culture Survey was conducted at Raipur terminal.

**Operation Chamak:** The belief behind this program is that effective Housekeeping can eliminate workplace hazards and get a job done safely.

#### **Technology Related**

Digitization is one of the critical business themes, wherein utmost priority should be given towards developing and implementing a Digitization roadmap. The use of technology for repetitive processes like Document Workflow Approvals, Collaborative tools and asset management system can be used to standardize process and reduce paperwork. These technological interventions allow higher operational efficiency and reduction in time and costs.

# Bulk Storage In India: A future looking, growing industry



**Mr. Prabakaran Muthukrishnan**

Global Head - Terminalling Business,  
Gulf Petrochem Group

With over 3 decades of experience in Senior positions of Logistics, Supply Chain, Terminalling, Distribution & Marketing. Mr. Prabakaran Muthukrishnan has a unique blend of experience holding strategic decision making positions in public & private sector oil giants in India. As the Head of the logistics chapter of the committee appointed by the Government of India for deregulating the Indian Oil industry, he is a firmly entrenched member of the Industry.

## 2.1. What in your opinion are the major growth drivers of Bulk Liquid Storage in India?

Multiple global forces are driving the demand for bulk liquid storage in existing & newer geographies. India being at the cusp of its growth phase is also experiencing the same. As bulk liquid is a vast sector, it can be divided into 3 different sections with each having its own drivers.

### 1. Hydrocarbons:

India is expected to be one of the largest contributors to non-OECD petroleum consumption growth globally. Oil imports rose steeply by US\$ 16.65 billion in 2017-18 over 2016-17 making India the third largest consumer of oil in the world with consumption increasing by 2.8% YoY (FY16 & FY 17). CAGR for Petroleum products consumption in India, has been 5.3% (FY 13 to FY 18) & looks to keep growing. Furthermore, forecasters such as BP Energy outlook put India's energy consumption growth at 4.2% p.a., faster than major world economies. This drastic increase in consumption pattern of the demographic & the continuous demand from industries would keep hydrocarbon demand high.

- **Refinery Conversion:** Restructuring & consolidation in refining capacities across India will impact the distribution & regional growth of storage capacity.
- **Trade Flows:** Change in trade flows due to emergence of new producers as well as consumption growth is impacting the location of new capacity additions.
- **Product Price Volatility:** Volatility in product prices for bulk liquids esp. crude oil necessitates the demand for more storage capacity in order to hedge trades for consumers & reduce the price volatility for producers.
- **Energy Security:** The Government of India is setting up 5 MMT of strategic crude oil storages at 3 locations. These storages would serve as a cushion during any supply disruptions like times of war or any other emergency situation.

### 2. Chemicals:

India is 3rd largest producer of chemicals in Asia by volume & creating more manufacturing capacity to process chemicals & agrochemicals to meet the domestic & global demand. Specialty chemicals market has witnessed a growth of 14% in the last five years, while demand of chemical products is expected to grow at 9% p.a. over the next 5 years. The key drivers for growth include:

- **Consumption Driven:** Per capita consumption of chemicals India is 1/10th of world average, & even among developing countries Indian consumption is low. This makes India a very attractive destination for growth.
- **Location Advantage:** India is centrally located between the East & the West of Asia, it at the center of trans-Indian Ocean routes which connect European countries in the west & to the countries of East Asia.
- **EODB & Regulations:** With Make in India, GoI implemented several structural reforms such as GST implementation & amending land acquisition act & increasing transparency.

### 3. Vegetable Oils

Growing population, economic growth & rising disposable income drive India's vegetable oil consumption growth, expected to grow by 3% p.a to exceed 34 MT by 2030. The country's vegetable oil consumption already reached 23 MT

(Approx.) in 2017. Due to stagnant domestic vegetable oil productions, import volumes continue to fill the gap between supply-&-demand. As per DoC, Crude Vegetable oil imports in same period grew at CAGR of 3.97% (Approx), while of refined Vegetable oil at a CAGR of 12.53%. Oils such as Palm oil, soy oil & sunflower oil are expected to penetrate regional markets, with the packaged edible oil segment leading the future growth of the industry.

### *2.2. What in your opinion are the major challenges faced by the Bulk storage industry at ports today?*

India's over 7500 km coastline is serviced by 13 major ports & over 230 notified minor & intermediate ports. In the past few years, the government has taken several initiatives to increase its investments by developing new ports, augmenting existing facilities & improving connectivity to ports. However, significant challenges are still present that hamper the growth of this sector:

- **Pre-Berthing Delays:** This challenge is an ever present cost driver seldom taken into account. In most Indian ports, due to multiple reasons procedural or administrative, vessels get delayed causing increase in freight charges that are passed on to end consumer. This increase in charges thus results in higher prices paid by the end consumer.
- **Draft Restrictions:** Draft depth at most Indian ports ranges from 9-14 m as compared to 12-23 m at international ports. Even though, the Government & Port authorities have looked to increase it, there is still some way to go.
- **Lack of dedicated berths:** Majority of berths at major ports are general cargo berths while only a few berths are dedicated for liquid bulk resulting in increase in idle time for vessels.
- **Tanks Pipelines & associated infrastructure:** Procedural inconsistencies & non-standardization of protocol causes delays & drives costs up for the terminal operator & the end consumer. Furthermore, Indian ports are faced with the challenge of inadequate number of pipelines with most ports having only 4-5 chemical lines per jetty. This increases costs by restricting operational efficiency, preventing simultaneous handling of products & directly impacting vessel turnaround time.
- **Terminal & Vessel Coordination:** Due to non-standardization of practices & relatively lighter enforcement of regulations multiple operational issues crop up during coordination between the Terminal & Vessels. These issues range from disputes over cargo discharge rates, consistency of cargo flow etc. There is an option with the terminal & the vessel to write Protest Letters, however due to lack of ground level knowledge of government operated escalation procedures they remain ineffective.
- **Constrained Port Capacities:** A critical challenge faced in liquid bulk handling is above -optimum capacity utilization due to capacity mismatch & inadequate port infrastructure. Liquid bulk capacity utilization at Indian ports stands at 90-95% (Approx.) compared to international average of 70-75% (Approx.).
- **Customs & regulations:** Due to multitude of stakeholders in the value chain ranging from suppliers to vessel owner/charterer, agencies on the supply side & Customs, Surveyors & last mile transport infrastructure on the demand side of the Terminal; storage operators deal with a long value chain. It's been observed that even a small bottleneck has cascading effects on lead times & increases costs.

### *2.3. How digitization is transforming logistics & supply chain management?*

Private players around the globe are investing in technology projects, to check feasibility of implementation of new technology in the Bulk Storage Sector. These technologies are extremely scalable & are geography agnostic, hence can be utilized globally. A few pilots for industry to look into in an effort to utilize technology:

- **Robots & drones:** Inspections are currently performed manually inside confined space; meaning that assets need to be shutdown to ensure the inspector's safety. The use of robots would minimize the exposure of personnel to potentially hazardous conditions, avoid these delays & reduce downtime. Likewise, diving remote operated vehicles can be used to inspect jetties & pipelines, while drones are being tested for the internal inspection of tanks.
- **Automation:** Multiple operations can be automated include the incorporation of level, temperature & safety systems that remotely alert terminal operators of the state of tanks & the cargo contained within.
- **Software & IoT:** Software can be used to increase vigil & visibility of tanks contents. Real time visibility enable tank operators to know if tank is being heated/blended, what pumps are being used to load/ unload a truck/railcar. This visibility translates into lowering redundancy & providing optimum operations, thus reduce costs.

Digitization & the use of technology aides the industry in accident reduction & provides for a safer working atmosphere for employees. From newer & more sensitive sensors to automatic shut off valves, technology provides terminal employees a chance of reducing their interaction with cargo. This helps in reduces effects on health due to vapour inhalation etc. Furthermore, the presence of automation tools aides to increase the efficiency of the terminal & reduces operational costs for terminal operators.

# A look at India's Logistics Sector



**Mr. Karan Adani**

Chief Executive Officer

Adani Ports & Special Economic Zone  
(APSEZ)

Adani Ports is today the largest port operator in India. From being a single port operator in 2009, they have come a long way. Today, APSEZ covers over 80 percent of India's hinterlands, with their focus being a pan-India port operator, providing end-to-end logistics. Looking to foray further across South Asia. APSEZ under the leadership of Mr Karan Adani looks emerge as a big regional player.

*3.1. In your opinion, how much help would big ticket government projects like Sagarmala & Bharatmala give to the overall logistics sector, what could the government do to increase the reach of such projects to the hinterland?*

Sagarmala focuses on Major Ports, their capacity, efficiency & connectivity. Bharatmala looks at road connectivity for ports. Various projects have been identified by Government under these two initiatives & such projects are making steady progress also. To ensure that intent of such initiatives is met, non-Major ports are to be given equal importance. Today, Mundra port is the largest port in the country & there are other ports owned & operated by various private sector players. Major Ports & non-Major Ports together form the effective & inter-balancing eco-system for ports in the country & thus we need to focus on all aspects.

Non-Major Ports have different mechanism of decision making, but Government can always form a panel which takes into account key pending issues / approvals from all non-Major Ports & tries to address them quickly. This way, Sagarmala & Bharatmala would truly achieve the intent of transforming & modernizing port sector in the country.

*3.2. There is a wide spectrum of players in the logistics sector ranging from the very small exporters & importers, to medium-sized & large traders to MNCs. How can a trader with small ticket size consignments could be integrated into the supply chain?*

Thanks to technology, aggregation of cargo is picking up in India. Various small & large logistics service providers are growing their business by focusing on aggregating cargo from smaller players. Another trend which can be seen, though in nascent stage, is logistics companies using technology platforms for making logistics easy for any size of the trader. Third factor is the ease of doing business & initiatives from Government like e-way bill & GST. All these trends together have made it much easier for even a small trader to do business & avail required logistics services. However, in my view, still two more factors need to be addressed: 1) gradually reducing cost of logistics using technology & focus on efficiency, & 2) enhancing reliability in movement of cargo for traders – through roads or railways

*3.3. The recently introduced GST & e-way bill is a step towards increasing efficiency, could any other tax structure changes be implemented that would aid in the growth of the sector?*

Taxation structure has another very critical dimension of Taxation mechanism. The mechanism comprises of people, systems, locations, papers etc., through which cargo owners, producers, traders & consumers do their taxation related transactions. Tax structure changes can be identified & addressed, but what more need to be addressed is the associated institutional structure. The way custom duties are calculated, evaluated & processed is something which can be addressed. The objective is not always to reduce such duties, but to simplify it enough so that traders as well as logistics players like ports etc. have their own ease of doing business with Government. As always, technology – through faceless & automated transactions, can play a major role in this.

*3.4. What broad directions (Regulatory/Skill development/ performance standards/ research & development initiatives) can the government look to work on help the logistics sector?*

Logistics is an emerging sector in India & it is yet to mature – whether it's trucking or warehousing or rail movement, a lot is to be done. In my view there are two critical aspects, which can be accorded highest priority – 1) performance standards, 2) skill development. I don't think logistics need to be regulated much, but it needs to build more reliability & efficiency. We need to ensure certain predictability in functioning of trains & functioning of state borders. Real time visibility can come through technology, but there is a substantial institutional component which need to be improved to get desired levels pf efficiency & reliability. Skill development is something which is a continuous process & will only

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increase in importance as we grow using more technology in logistics. In this domain, both Government & Private Sector have to work together to be future ready.

### *3.5. What role can technology & IT play in helping the optimal utilization multi modal transport resources optimally?*

Logistics is an area which generates lot of data points & uses such numerous data points or pieces of information. Furthermore, there are multiple stakeholders involved at all the stages, exchanging information, paper & cargo – each having its own perspective of looking at the transaction. For example, a truck driver has to reach in time with cargo, but the trucking company would also be looking at fuel consumption, while the tax personnel would be concerned about the duties & type of cargo. Customer, in turn, would have the larger business focus in mind & thus would have a different set of KPI's, including the efficiency, reliability & cost.

Technology is the only solution of binding such a diverse universe together. Bringing all these stakeholders & information together, & making sense of it, so that all stakeholders are satisfied is the role technology has to do, in an integrated manner. That's why, when we talk about technology for logistics, we talk about large data, reliability, visibility & extended nature of systems.

# Sagarmala; Port led prosperity for the Nation



## **Sh. D. K. Rai**

Dir (SM), Ministry of Shipping

Sagarmala Development Company  
Limited

Sh. Devendra Kumar Rai is the Director of Ministry of Shipping's flagship Sagarmala Programme. Leading from the forefront Mr Rai handles the width & depth of the entire project, from Port Modernization & New Port Development, Port Connectivity Enhancement to Port-linked Industrialization & Coastal Community Development.

### *4.1. What are the MoS's targets & achievements in terms of project award & completion for Sagarmala Projects?*

As part of Sagarmala Programme, 601 projects worth Rs. 8.8 Lacs Cr. have been identified for implementation, through 2015-2035, across areas of port modernization, new port development, port connectivity enhancement, port-linked industrialization & coastal community development. Out that 105 projects worth Rs. 16,586 Cr have been completed. In FY 2018-19, 109 projects worth Rs. 50,510 Cr are likely to be completed. Further, 345 projects worth Rs. 3.76 Lac Crore are already under various stages of implementation & development.

**Port Modernization:** 266 projects worth Rs. 145,096 Cr identified, out of which 60 projects worth Rs. 9,705 Cr already been completed & 67 projects worth Rs. 46,003 Cr are under implementation.

**Port Connectivity:** 213 projects worth Rs. 250,915 Cr identified, out of which 213 projects, 29 projects worth Rs. 5,269 Cr have been completed & 63 projects worth Rs. 60,124 Cr are under implementation.

**Port led industrialization:** 57 projects worth Rs. 474,893 Cr identified, out of which 2 projects worth Rs. 512 Cr have been completed & 17 projects worth Rs. 147,494 Cr are under implementation.

**Coastal community development:** 68 projects worth Rs. 7,167 Cr identified, out of which 14 projects worth Rs. 1099 Cr have been completed & 17 projects worth Rs. 1,114 Cr are under implementation.

### *4.2. What are the funding sources being explored for the Rs. 8 trillion investment requirement in the Sagarmala Project?*

Projects under Sagarmala are being implemented by relevant Central, State, Ports & other agencies primarily through the private or PPP modes. To assist in implementation of residual projects, Sagarmala Development Company Limited (SDCL) was incorporated to provide funding support to project SPVs & residual projects under Sagarmala. SDCL has identified a few projects for the purpose of equity investment in-line with Sagarmala objectives. Additionally, SDCL is also in process of preparation of DPRs for specific projects that could provide avenues for future equity investment by the company. Indian Port Rail Corporation Limited (IPRCL) was incorporated in July 2015 to undertake port-rail connectivity projects under Sagarmala Programme.

Ministry of Shipping's Coastal Berth Scheme has been made part of the Sagarmala Programme. The scheme aims to provide grant-in-aid assistance for construction/ up-gradation of coastal berths at Major/ non-major ports, capital dredging of operational non-major ports, construction of breakwater for existing & green-field ports etc. Ministry of Shipping has sanctioned Rs. 1,742 Cr & released Rs. 1,018 Cr for the development & implementation of 87 projects worth Rs. 5,501 Cr.

Sagarmala projects are being executed in a phased manner keeping in mind the needs of various stakeholders, requirement of infrastructure at specific locations, viability of the projects, readiness of the ecosystem including logistics supply chain, environmental concerns & sensitivities of the local communities. Considering the scale of the programme, the involvement of private participation becomes imperative to achieve the desired results.

### *4.3. What are the steps being taken for the inclusion of an efficient Public-Private-Partnership in taking the Sagarmala Programme further?*

For a programme at the scale, private participation plays a key role. Private sector role in port sector has been realized since early 1990s & 41 PPP projects involving an investment of about Rs 20,000 Cr are in operation, creating a capacity of 368 MT. 16 PPP projects entailing an investment of about Rs 20,000 Cr & 268 MT capacity are under implementation.

To encourage private participation, rules are being modified to enable private firms to invest. Concession agreements & processes are being standardized at all major ports & a model concession agreement has been introduced. Some of the key features of the model concession agreement include:

- Concessionaires could exit projects by divesting 100% ownership after 2 years of commissioning, while earlier the developer had to maintain 26% stake throughout the concession term.
- Developers can pay royalties to landlord ports on a "per mission tonne of cargo handled" basis subject to wholesale price index annually. Earlier the revenue share was payable on a gross revenue basis with fixed bands & did not take into account any discount extended to customers.
- Port charges for additional waterfront has been reduced from 200% to 120%.
- Freedom to upgraded capacity equipment, facilities & technologies to achieve higher productivity of assets.
- Compensation entitlement if local laws change with potential impact on financial viability of projects.
- Separate constitutional body to address disputes between concessionaires & landlord ports. Online complaint portal has also been set up.

#### *4.4. What is the status of Greenfield port projects & the 14 coastal economic zones that have been announced, is there a possibility of increasing this number?*

A total of 6 Greenfield ports are being planned under Sagarmala, with an estimated cost of Rs. 36,200 Cr. These new ports are expected to add about 150 MTPA of port capacity. These are long term projects & are expected to be completed in 2025. 3 of these projects are under development & DPR is under preparation.

**Coastal Employment Zones (CEZs)** have been envisaged to facilitate port led industrialization &/ or Export Import (EXIM)/ coastal trade of goods & commodities. CEZ is an economic region comprising a large area in a single or in a group of coastal districts with strong linkage to ports in that region with an intent to reduce the logistics costs from demand/supply center to port & vice versa. CEZ has dual focus – direct contribution of port traffic coupled with employment generation & reduction of logistics costs. Such zones are envisaged to comprise industrial areas, housing & urban infrastructure & logistics/ transport infrastructure within themselves & be self-contained.

One prototype CEZ of around 2,000 to 3,000 acres will be taken up with an estimated total expenditure of around Rs. 2,000 crore (to be shared by central & state government in 49:51 ratio) towards project development activities, cost of land & provisioning of trunk infrastructure. The central government expenditure will be spread over a period of 4 years, around Rs. 250 crore/year aggregating to INR 1,000 crore. This CEZ would be selected based on the Challenge Method. Depending on the success of the prototype CEZ selected above, more CEZs may be developed under this scheme. A total of 14 Coastal Economic Zones (CEZ) are also proposed under Sagarmala, with an estimated cost of Rs. 40,500 Cr.

#### *4.5. What are the key challenges being faced by the logistics sector in India & how does Sagarmala Programme looks to overcome them?*

Indian Logistics & Maritime Sector has been historically faced many challenges & Sagarmala is taking prudent steps & initiatives to mitigate them & find an efficient, sustainable solution for development.

**Port Infrastructure:** Indian ports have inadequate capacity & productivity as compared to international standards. Complicated procedures & documentation results in increased time in movement of cargo. To address the challenges, port modernization & capacity enhancement projects are being undertaken across all major & non-major ports. Further, improved technology is being deployed to improve efficiency at existing ports.

**Last Mile connectivity:** India has a low share of inland waterways & coastal shipping in the modal mix. There is also lack of requisite infrastructure for evacuation from the ports. To promote coastal shipping, relaxation on cabotage & related taxes for an extended period has been implemented. To further promote the coastal shipping Coastal Berth Scheme has been introduced by the Ministry of Shipping.

**Industrialization near ports:** India has limited development of EXIM oriented manufacturing facilities near ports as historically the economy has been driven by hinterland states. This leads to lesser employment opportunities for coastal communities. Addressing the issues, port led industrialization initiatives are being taken to develop & shift large & ancillary industries near ports for efficient & faster movement of EXIM goods. Further, to enhance the development of coastal communities, multiple skill development programmes are being undertaken.

# Terminal Safety; A pressing concern



## **Dr. Ferenc Farkas**

Business Development Advisor

Swiss Fire Protection Research & Development AG (SFPRD)

Dr Ferenc is an advisor to the Swiss Fire Protection Research & Development AG (SFPRD), an organization with a singular focus to establish higher safety status in the energy industry, especially when it comes to highly exposed large-diameter atmospheric storage tanks & dikes. At SFPRD, a dedicated team of fire protection, chemical, HSE, mechanical engineers and safety protocol experts work relentlessly to address seemingly unsolvable fire safety challenges.

*5.1. Bulk liquid storage brings with it a host safety concerns, in your opinion what would be the foremost measures that the industry must take to keep the installation employees & assets safe from these ever present hazards?*

As I often see, the more time passed since the last serious incident, the attention becomes less & less eager, the more the false sense of “not happening to us” develops. In my opinion, security requires constant vigilance, renewal & continuous investment in both human knowledge & best available technologies.

*5.2. Emergency response is an integral part of safety, especially in the volatile world of Liquid Bulk Storage. What in your opinion can the government &/ or federal bodies do to aid in providing services that would reduce the impact of accidents?*

Speaking a little biased, I think the most important thing is that where you can rely on automatic extinguishing systems, you should, & not sending the first responders to their brave, but life-threatening fight. New built-in instant foam systems can start extinguishment in around 10 seconds after the fire has broken out, & by the time firefighters arrive to the scene, they are no longer confronted with a fire of up to 5,000 m<sup>2</sup>, but a full foam blanket covering the entire surface - or in worst case, some small flames flickering in a hidden corner. This is a huge difference in efficiency, saved value & threat to life.

*5.3. From a regulatory perspective, what in your opinion should be the direction, the Government should head in to set standards for safety in Bulk Storage Terminals?*

Although both parties are striving for something different, unfortunately, in most cases, the authority is not deemed to be a partner for the industry, but rather a punishing supervisor who should be afraid of & better to be left alone by. This leads to the blind, letter by letter following of regulatory requirements, which hinders innovation: I have been involved in many discussions where the company saw a new technology much better & more efficient, but since it was not “by the standard”, they did not dare to take up a multi-year procedure of authority approval. Instead, they chose the old, traditionally accepted technology - that's why most of the sites are still using the same methods as in the 50s & 60s. In other areas, the world has changed much, so why are innovative the new ideas so hard to break through in this field?

*5.4. How can the use of new safety technologies be utilized & propagated to different terminal operators in a fragmented market of Bulk Storage?*

Ideally, governments may be at the forefront of the process of cognition of new technologies & may help to spread them. Innovation often comes from small & medium-sized enterprises, which have a difficult time to fight with large international conglomerates, while the inflexibility & ultra-slow change process in the regulatory requirements are both counterproductive to innovation. Governments can also gain knowledge about new technologies by using grants, subsidies or government-funded tests, which can then be incorporated into regulation.

*5.5. What in your opinion can be done in partnership with the Government to spread awareness about the importance of asset safety & safe working habits in high risk areas such as bulk storage terminals?*

As safety is in everyone's interest, so I think in the best case scenario a government should support, or incentivize, in some way, compliance with safety rules & using innovative, more efficient technologies. We live in a profit-hungry world, management usually optimizes for the short term & perceive security investments as a necessary bad, or even money thrown out the window. One may be angry about that, but if it is so, then governments need to incorporate short-term incentives that take this into account, eg. Tax exemptions for security investments or PR for good company practices etc.