J. M. BAXI GROUP

TIDINGS

ISSUE XXVI

JULY - SEPTEMBER 2019

July - September 2019

Newsletter Issue XXVI

Table of Contents

J. M. BAXI GROUP

TIDINGS

EDITORIAL TEAM:

Mr Nandan Yalgi
Mr K K Krishnadas
Capt. Tamal Roy
Mr Sushil Mulchandani
Capt. Sunil Chopra
Mr Siddhartha Roy
Cdr. Sunil Dhulekar
Mr Shirishchandra Shah
Mr Rajnish Khandelwal
Mr Keki Master
Mr Samir Shah
Mr Sunil Shetty
Ms Meera Kumar
Mr Ajay Tolani
Mr Ashish Sharma
Ms Shwetal Kharbari

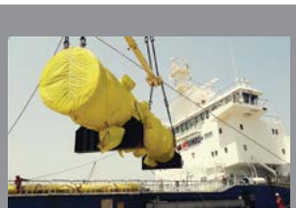
DESIGN TEAM:

Ms Dhara Kapadia
Mr Bhushan Ghatkar
Mr Jayakumar Ramajayam
Mr Amit Sawant

COVER PAGE:

SPECTRUM OF THE SEAS
berthed at MUMBAI Port

* All maps are for representation purpose only



J M BAXI GROUP
A: Dubash House, 15, J. N. Heredia Marg, Ballard Estate, Mumbai - 400 001. Maharashtra. INDIA.
B: +91 . 22 . 22104444 | F: +91 . 22 . 22616222 | E: corp@jmbaxi.com | W: www.jmbaxigroup.com

From the Quarter Deck

Dear Friends and Colleagues,
The 2019 elections in India for the 17th Lok Sabha have concluded, and the incumbent BJP-led NDA government under the leadership of Mr. Narendra Modi has achieved a landmark landslide victory, resulting in Prime Minister Modi returning back with a stronger mandate to lead India. Out of 543 seats in the Lok Sabha, the BJP won 303. Other members of the NDA won 50 seats, giving the BJP-led NDA a total of 353 seats and ensuring it has a strong majority for the next term of five years as the new government.

The new government consisting of Cabinet Ministers and Ministers for State presents a promising term. For us in the maritime, logistics and transportation business Mr. Nitin Gadkari will continue as a Cabinet Minister for Ministry of Road Transport and Highways of India. We have Mr. Piyush Goyal as Cabinet Minister of Railways as well as Cabinet Minister of Industry and Commerce. Mr. Mansukh L Mandaviya will continue his charge of Ministry of Shipping and Ports as an independent charge. Mr. Dharmendra Pradhan continues as Minister of Petroleum and Natural Gas.

The continuity of the ministers for these departments will support the quick and continuous implementation of the strategies and efforts of the government. Work on finding a solution for the non-performing assets held by the banks in India will hopefully see continued progress. This should enable a twofold result in which stuck and stranded assets are rebooted and restarted as well as increasing the availability of fresh capital for development.

In the near future will see the completion of the Dedicated Freight Corridor (DFC) connecting the northern hinterland with ports and cities on the west coast of India and implementation of the high speed rail link between Mumbai and Ahmedabad. It is also expected that the government will strongly prioritise programmes to revive various sectors like agricultural sector with special focus on food processing industry and irrigation, oil and gas sector and shipbuilding in India.

The riverways and waterways will continue to be developed and the various plans already under implementation on the river Ganges, including the development of terminals at important locations like Varanasi Sahibganj and Haldia, will result in a strong river and waterway transportation system.

Some of the challenges on the international horizon are a cause of great concern. The ongoing tariff war between the USA and China does not seem to be abating and it is creating a great deal of uncertainty for global trade. Another area of concern is the deterioration of stability around the Middle East in general and Iran in particular.

On the international shipping front in the bulk carrier segment, we are seeing some developments both in terms of changes to routes due to the increasing size of the ships as well as to their pricing structure. The genesis of some of these changes can be linked to the disastrous collapse of the dam at Vale's mining site. The tragedy led to the closure of the Brucutu iron ore mine and Vale's subsequent decision to decommission ten defective dams, which has resulted in 70 million tons of iron ore not being available for the export market. Similarly, on the liquid side, with the USA now becoming a significant exporter of crude oil, we are seeing crude tankers beginning to move "the other way".

It has been heartening to see that most of the large container carriers declared reasonably positive results for 2018 as well as posting good results for the first quarter of 2019. However, the large carriers have expressed concerns due to an expectation of increased fuel costs and a possibility of declining volumes. Coming closer to home and at the

J M BAXI GROUP, we have seen continuous positive developments at our terminals and facilities. Vizag continues to see steady growth and we have started work on the expansion of VCT. We are investing close to Rs 900 crores to meet the conditions laid out by the port authority and we are challenging ourselves to complete this project once again in record time without compromising quality. This should be our first million-TEU terminal. Our terminal at Kandla, KICT, has consistently continued to gain traction and we can confidently say that by the end of 2019, we should see an annual throughput of over half a million TEU. DICT once again continues to grow and it is very much on its way to becoming a 250,000 TEU facility. HICT at Haldia and RICT at Rozi have continued their positive growth stories. PICT at Paradip, like other places in Odisha, withstood the aftermath of Cyclone Fani. Whilst we at Paradip were fortunate to have missed the worst of the cyclone, unlike Puri and Bhubaneswar, kudos to our terminal team, who ensured the safety of all our colleagues. They faced the disruption to railway movements and bore the brunt of the heavy rainfall, which disrupted their work and risked damaging cargos. Despite these unforeseen events, it remains on its journey to becoming a successful multipurpose clean cargo terminal.

Due to space constraints, I have not covered agency services, logistics and the technology verticals in this issue; however, I will feature them in an upcoming issue ■

Krishna B. Kotak
Chairman - J M BAXI GROUP

Agency & Services

SPECTRUM OF THE SEAS Called MUMBAI And KOCHI In May 2019

In the wee hours of 9th May 2019, as Mumbai slept a gigantic and beautiful cruise ship quietly entered the harbor and docked at the berth. The Royal Caribbean Cruise Line's (RCL) - Spectrum of the Seas , one of the world's largest and most luxurious ships called at Mumbai on its maiden voyage from Barcelona to Shanghai. This was the largest cruise ship to ever called at Mumbai. J. M. Baxi & Co. had the privilege of Spectrum of the Seas , as their agents for the calls at Mumbai and Kochi.

Spectrum of the Seas is the first Quantum-Ultra class vessel designed and built specifically for the Chinese market. Quantum-Ultra is an upgraded (enlarged and enhanced) version of the Quantum-class ships Anthem, Quantum and Ovation. This 348 meters long, 168,666-ton ship is the largest ever to call at ports in India and can accommodate a total of 5,622 guests and 1700 crew. The ship will debut her Shanghai season from June 2019.

The ship called Mumbai and Kochi with approximately 4500 passenger and 1600 crew. With this huge compliment on board and the ship calls being only for about 12 hours in each port, it was essential that the immigration and customs clearances be carried out expeditiously to maximise the passenger time ashore. Special approval was taken from the Bureau of Immigration to depute six immigration officers to the previous port of call (Muscat) to carryout immigration clearances during the passage to Mumbai. At Kochi, additional immigration officials were requisitioned from the airport and a huge temporary tent was setup for the Immigration staff.

To celebrate these maiden calls in India, plaque exchanges were conducted between Spectrum of the Seas ' Captain Charles Teige and various government officials. At Mumbai, the plaque exchanges were done by Shri Jaykumar Rawal, the Honourable Minister of Tourism Maharashtra, Shri Sanjay Bhatia, Chairman of Mumbai Port and Mr Bani Bhattacharya, Chief Commissioner of Customs, Mumbai. At Kochi, Mr AV Ramana, Deputy Chairman of the Cochin Port Trust exchanged plaques with the ship's captain. Plaques were also exchanged between the J. M. Baxi & Co. and the ship at both locations.

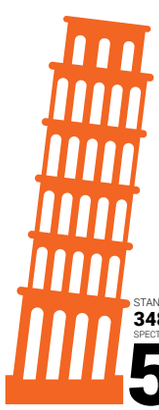
The J. M. Baxi & Co. team at Mumbai and Kochi along with the Cruise Cell at the Headquarters made special arrangements for receiving the ship in India. Preparations had commenced almost 10 months ago, with RCL deputing their Risk and HSSE officials to evaluate the berths available at Mumbai and Kochi. The ship could not be berthed at regular berths which have Cruise Terminals and therefore posed major challenges.

Agency & Services

At Mumbai, due to the excessive height of the pier above the waterline at the Indra Offshore Container Terminal and the large range of tide, innovations were the order of the day as special platforms were fabricated to enable gangways to be placed on much higher decks than the ship is normally designed to accommodate them at. The gangways had also to be shifted from one deck to another as the tide changed with passenger movement ongoing on the pier.

The hard work, ingenuity and dedication of all the staff involved in handling the ship paid off in good measure with J. M. Baxi & Co. getting rave reviews for its performance. Alessandro Carollo, the Director of Port Operations of RCL for Europe, Middle East and India had the following to say

> "I believe it is important to recognize hard working people, who never give up nor slow down for any reason; your team at the port of Mumbai has gone the extra mile once again, and delivered a fantastic call of the Spectrum of the Seas.
>
> I personally saw them days before ship's arrival, working on the pier, in order to make sure all the necessary services were in place, and I remember being extremely surprised when I realized they spent tireless days and nights, until (and including) the day of the call.
>
> I have an incredible amount of respect for a team that knows no pause nor rest, until the project is delivered, working around the clock and having such knowledge of the operations and pride in what they do; I'm pretty sure this is not news at all to you, but I wanted to make sure I highlight their commitment, efforts and dedication, in order to make such a success of the Spectrum of the Seas ' call, under difficult and challenging circumstances, as well as the pressure of having media and attention from the wider cruise community in India.
>
> They are the team who not only delivered the Spectrum's call, but an entire season for the rest of our ships in the region, Celebrity Constellation, Azamara Quest and the Explorer of the Seas, please make sure you convey my sincere gratitude for their hard work and dedication ■"



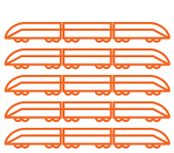
STANDING UPRIGHT AT **348 METERS** SPECTRUM OF THE SEAS IS **5.5 TIMES TALLER** THAN THE LEANING **TOWER OF PISA** IN ITALY, FRANCE

SPECTRUM OF THE SEAS IS **28 TIMES LONGER** THAN A 12-METER WHALE SHARK

WITH **2,137** STATEROOMS SPECTRUM HAS MORE GUEST ACCOMMODATION THAN THE J W MARRIOT MARQUIS HOTEL IN DUBAI

THE RECYCLED GLASS DURING SPECTRUM OF THE SEAS IS INAUGURAL SEASON IS EQUAL TO THE WEIGHT OF **1,877** FEMALE GIANT PANDAS

348 METERS LONG SPECTRUM OF THE SEAS IS **5** TIMES **LONGER** THAN **THE BRANDENBURG GATE** BERLIN, GERMANY



SPECTRUM'S 4 BOW THRUSTERS PRODUCE **4,694** **HORSEPOWER EACH** WHICH IS MORE THAN **2x THE HORSEPOWER OF A 5-CAR NEW YORK CITY SUBWAY**

SPECTRUM OF THE SEAS

92 METERS HIGH NORTH STAR IS **THRICE** AS TALL AS **CHRIST THE REDEEMER STATUE** IN RIO DE JANEIRO, BRAZIL

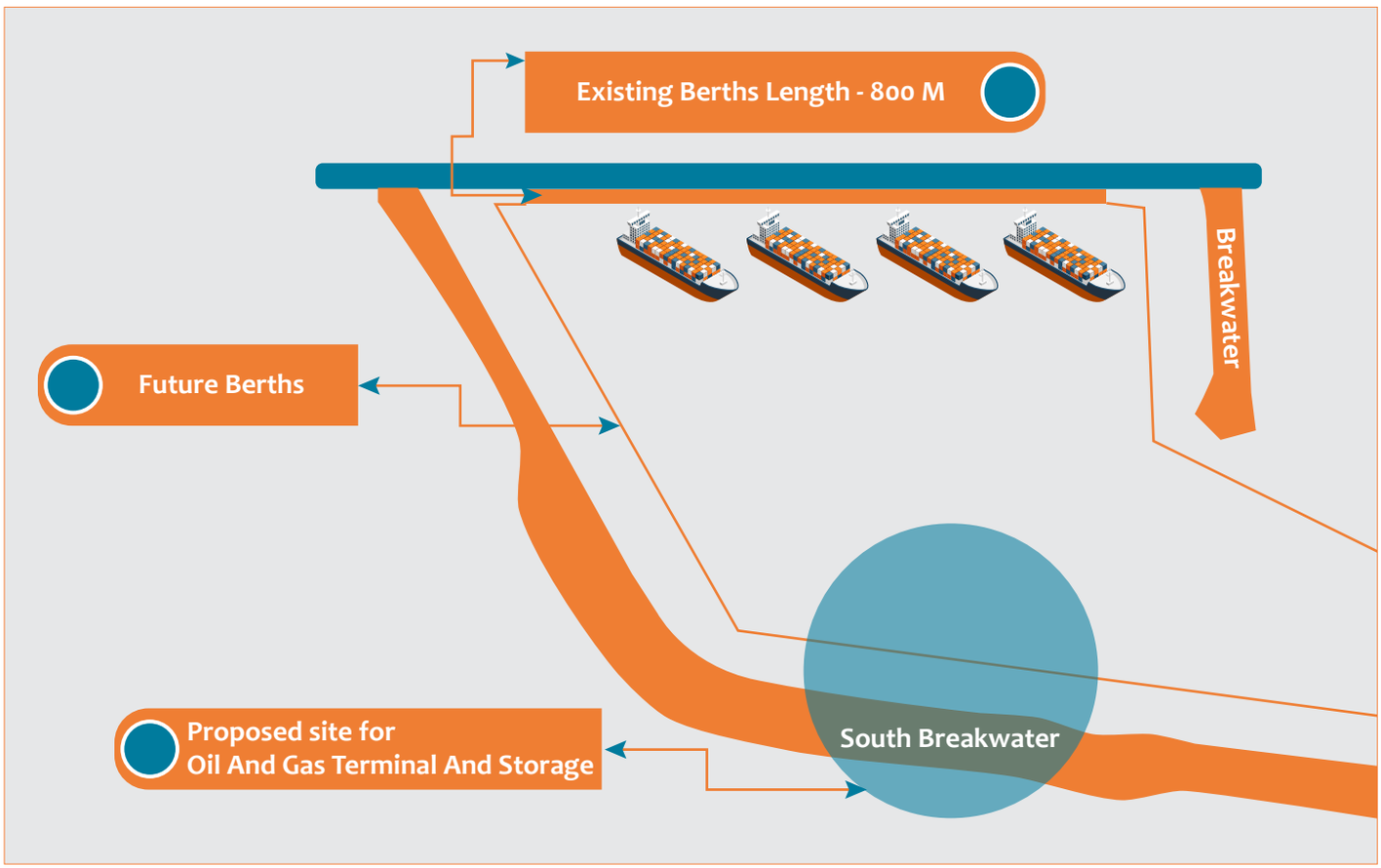
THE WIDTH OF SPECTRUM IS **9 TIMES WIDER THAN** THE GREAT WALL OF CHINA AT MUTIANYU

AT 168,666 GRT, APPROXIMATLEY **56 BILLION LYCHEE** COULD FIT INSIDE SPECTRUM OF THE SEAS

Agency & Services

Port Of GOPALPUR

(Continued from Issue XXV)



GPL Development Plans - Future

- Following the entry of SP as the majority stakeholder, the operations of GPL have been stabilized. The first project undertaken by GPL involved the construction of two more multi–purpose berths that would take the quay length to 800 M. These two berths were commissioned some weeks ago taking the potential capacity of the port to 25 MTPA as claimed by GPL.
- Construction of the breakwater is also complete. It is reported that dredging work for the new berths would be completed next month.
- Mechanization and automation for handling fertilizer and coal, minerals and fertilizer under progress.
- Dredging project for enhancing draught to 16 M due to be undertaken in near future reportedly.
- The distance of Gopalpur Industrial Park from the port is about 8 KM; a new connecting road corridor is under construction that will reduce this distance to 3 KM.
- In order to boost its traffic, GPL is also ready to offer land to potential investors reportedly, for development of storage facilities for LNG/LPG/Bunkers/ POL Products and Coal subject to mutual agreement. GPL is apparently ready also to offer an existing berth with a backup area or allow development of a new berth with back up storage for handling LNG/LPG/POL or other liquid cargoes.
- Similarly, GPL is reported to be open to considering proposals for building a Container terminal and/or an ICD/CFS either with an existing berth or as a new project.
- Like all other Indian ports, J. M. Baxi & Co. handles vessels under their agency at Gopalpur Port (GPL) also ■

In Conversation

The Vision Of IWAI By Shri PRAVIR PANDEY

Q: In the current landscape and ecology of coastal and inland transport, how does the Inland Waterways Authority of India (IWAI) envisage this method of transport will grow?

Ans: Inland waterways are being declared as national waterways, which are the feeder channels to the ports. They are bringing the hinterland and its cargo to the sea. For example, the Ganga River flows to Kolkata Port and the Mahanadi to Paradip Port. Coastal and inland transport are complementary to each other. One of the issues with the Indian Vessel Act 2007 was that one had to get the permission of the Director General of Shipping for each voyage, which was a cumbersome process. The Ministry of Shipping has declared that the sea up to 5 nautical miles from the beach is inland water, which is a huge change. Vessels that can withstand waves up to 2 m high do not need permission for each movement. So, vessels can pass between inland waterways and coastal waterways and vice versa.

Under the Jal Marg Vikas Project (JMVP), which is being assisted by the World Bank, we commissioned a German company, DST GMbH, to design vessels. Typical vessels require less power, are cheaper and are more efficient. They also designed reverse sea vessels (RSVs). The plans are on our website and they can be used by anyone. We are also procuring some RSVs for seamless movements between the national waterways and coastal waterways.

We are building a jetty near ECO plant on Mahanadi river. The consignment of fertilizer will move 8 Km through Mahanadi river under IWAI

Shri Pravir Pandey, Chairman of Inland Waterways Authority of India (IWAI) and Project Director of Jal Marg Vikas Project, is a 1992 Batch Officer of the Indian Audit and Accounts Service (IA&AS) and had been a member of Indian Civil Services Team in 1995-1996.

He has worked as Director, Ministry of Home Affairs, and Government of India in 2002-2007. Later, he undertook various UN Assignments at London, Geneva, Manila, and Riyadh before serving as the Auditor General of Uttarakhand in 2008-2011. He was then posted as Minister in the Embassy of India, Washington DC from 2011-2014.

Since March 2014, he has been in the Inland Waterways Authority of India, Ministry of Shipping, first as Member (Finance) and then Vice Chairman and the Project Director of the prestigious Jal Marg Vikas Project that is being implemented with the technical and financial assistance of the World Bank for the development of river Ganga (NW 1) for navigation.

Shri Pravir Pandey has taken upon himself to re-write the history of navigation on river Ganga. He is steering the organization's goal of restarting navigation on Ganga from Varanasi to Haldia.

To conclude, the synergy between coastal and national waterways is important.

The Cabinet Committee on Economic Affairs (CCEA) approved the implementation of JMVP on 3 January 2018 at an estimated cost of Rs 5,369 crores. The project is receiving technical and financial assistance from the World Bank. The objective of JMVP is to improve the navigability of National Waterway 1 (NW-1) for vessels of up to 2000 dead weight tons (DWT). The major activities under the project are the construction of multi-modal terminals and jetties, a river information system, channel marking, navigational locks, river training and conservancy works. It is scheduled to be completed by March 2023.

In India, a number of central and state agencies play a role in the regulation, operation and sustenance of inland water transport. Smooth collaboration and functioning are required for inland water transport to be viable.

Some of the factors in this sector are:

- Inland Waterways Authority of India (IWAI)
- Central Inland Water Transport Corporation Limited (CIWTC) and other operators
- Customers
- State governments
- Port authorities
- Transport development agencies

Q: Who are the key stakeholders that IWAI aims to cater for and what is the expected growth?

Ans: For every waterway, the commercial viability is based on

In Conversation

two or three key commodities. For National Waterway 1, these are coal, stone chips, aggregates (construction material) and containers. From June 2019, two companies will start shipping rice in containers from Varanasi to various locations. Adani Wilmar Limited is planning to move edible oil and other products from Varanasi to Dhaka. There are huge demands for containerised cargo, followed by FMCG products. Pepsi Co has stated that some of the benefits of transport by water is that there is no pilferage, no damage en route and no thefts.

JMVP was initiated in 2018. In 2015/16, 3.5 MMT of cargo was shipped along inland waterways. Today, we have reached a mark of 7 MMT. The Varanasi Multi-modal Terminal is ready and operational. The Sahebganj Multi-modal Terminal in Jharkhand is in development and hopefully will be inaugurated in July. Haldia Multi-modal Terminal will also be complete by the year end. Our projections are that by 2021/22, cargo volumes will reach 23 MMT. This increase in transport by inland waterways will reduce congestion and pollution on the roads and contribute to reducing India's carbon footprint.

- Barge operators
- Shippers (like mine owners)
- Operators in Bangladesh
- State governments

IWAI has been making special efforts to promote the movement of cargo along national waterways. In the first half of 2018/19, cargo traffic had increased to 33.8 MMT compared to 16.7 MMT in the same period in 2017/18, which is 102 per cent more.

Q: What facilities are there for coastal movements?
Ans: We have three multi-modal terminals. Varanasi Multi-modal Terminal is ready and operational. Sahebganj Multi-modal Terminal will be ready by July and Haldia Multi-modal Terminal by November. Apart from these, we have a small container terminal at Kali Ghat. We also have a multi-modal terminal in Guwahati for trade with Bangladesh.

Q: What challenges does IWAI face while providing services to its stakeholders?
Ans: Vessel financing is one of the major challenges. The payback period to the banks is generally 8 to 9 years. However, a vessel can be operated for only around 25–30 years, which is not proportional in terms of the payback period.

Vessel design is another issue. We have designed vessels with DST in 14 categories, such as bulk cargo, break-bulk, containerised cargo, automobile carriers, etc.

The Financial issue which needs to address is "Income Tax" levied on barges and small boats which will be plying under IWAI. Under Merchant shipping act, the vessels plying can accumulate the same for 7 years. And he gets the credit of same if utilized for shipping activities.

This needs to be applicable to vessels plying under IWAI also.

Q: Does the IWAI compete with private operators?
Ans: IWAI has nine vessels, which are run by operators. The IWAI is an authority like the National Highways Authority of India (NHAI) and as such will not operate its own vessels.

Q: The government of India has a vision for a Digital India and is running ease of doing business (EoDB) initiatives to enable e-payments, e-delivery orders, etc. How is data exchanged among stakeholders?
Ans: We have established a River Information Station (RIS) from Varanasi to Haldia. It stores DGPS data for vessels and it provides channel data through electronic navigation charts to shipmasters. It has a night navigation facility and information on the condition of the river (velocity, area, etc.). It knows whether a vessel is going into the channel or diverting from it. However, all of these pieces of information need to be integrated. For example, the officers on a ship starting from Haldia will want to know about the conditions in Varanasi or Jharkhand. Thus, a digital platform needs to be built. We are working with a team of EY and World Bank experts and have developed a design for such a digital platform. For example, it will be able to list which ships are arriving at Varanasi on 30 May, when they will berth and their capacity. For each, it knows what warehousing capacity is required, how many containers it can carry and how long it will take to load the containers. It can tell you when the vessel will start from Varanasi and when it will reach Patna. In addition, it knows about any special requirements for the vessel.

Q: Coastal movements are not only via inland waterways but also for trading across the border with Bangladesh. How do Indian customs facilitate this trade?
Ans: Customs agents are already in place. Currently, 3 MT of fly ash goes from India to Bangladesh every year. Moreover, hundreds of Bangladeshi vessels carry fly ash from the National Thermal Power Corporation Limited (NTPC) power plant.

Q: Which route has started for passenger under IWAI?
Ans: Cruise vessels have started carrying passengers between Kolkata and Dhaka.

Q: The government of India has launched serious initiatives to improve the connectivity through inland waterways for passengers. What is planned for the new passenger terminals?
Ans: The systems are very transparent, fast and robust. IWAI had a budget of Rs 80 crore up till 2014. In the current financial year, we crossed the Rs 1,000 crore mark and 80 per cent of the tenders have been completed successfully ■

Logistics

BOXCO Handles The Transportation Of The

Prestigious HPCL VIZAG Project

Boxco Logistics successfully handled the first leg of the Hindustan Petroleum Corporation Limited (HPCL) refinery project for Larsen & Toubro Hydrocarbon Engineering Limited (L&T HCE).

The project involved multimodal transport of 8 ODC and Heavy lift packages from the L & T Hazira plant to the HPCL Vizag refinery. The packages were first moved from L &T Hazira to Adani port in Hazira where they were loaded on Boxco's SPMT's; then they were shipped on a Jumbo vessel M.V Fairmaster to the Hindustan Shipyard Limited (HSL) Jetty in Vizag and then moved by road to HPCL Vizag.

The scope of the contract included obtaining permissions for berthing a heavy lift vessel at the HSL Jetty which is a Naval Shipyard. This is an extremely difficult task and the J M BAXI GROUP utilized all its resources to obtain the permission. The project required culverts to be constructed and built by-passes for smooth passage of the cargo.

This project showcased Boxco's elaborate equipment-base and its expertise in organising heavy-lift ocean freight and its operational capabilities. The second shipment under this project will be executed in June 2019 involving a huge 798 MT Fractionator column ■

Infrastructure

Dedicated Freight Corridor

The existing trunk routes of Howrah-Delhi on the Eastern Corridor and Mumbai-Delhi on the Western Corridor are highly saturated, with capacity utilization varying in the range of 115 per cent to 150 per cent. Though the four routes that form the Golden Quadrilateral - connecting Delhi, Mumbai, Chennai, and Kolkata together with two diagonals (Delhi – Chennai and Mumbai – Kolkata), account for hardly 16 per cent of the railway network's route length, they carry more than 55 per cent of total rail freight of India. Apart from this, the National Highways along these corridors, comprising 0.5 per cent of the road network, carry almost 40 per cent of the road freight.

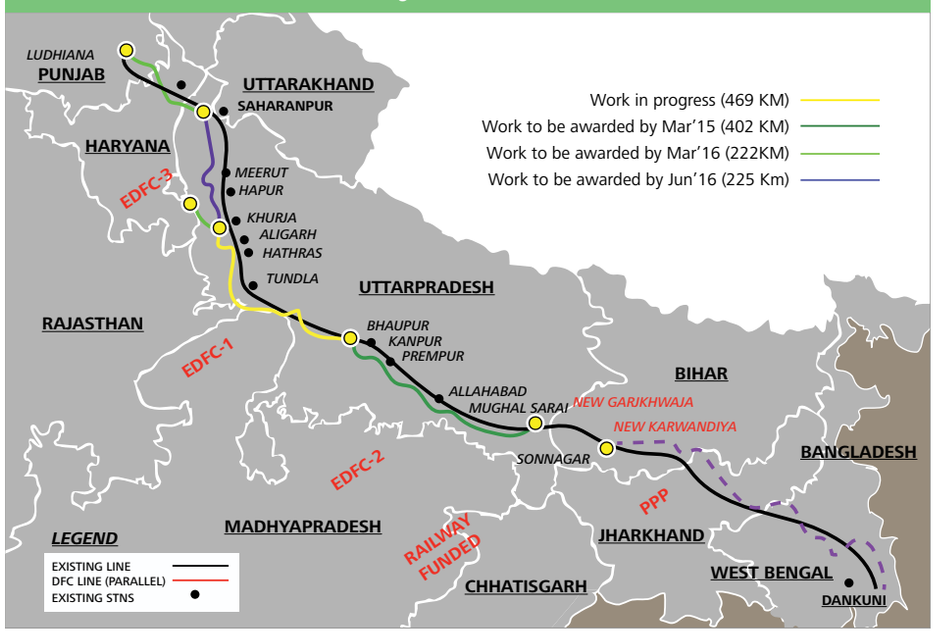
With freight traffic projected to grow at more than 7 per cent annually, Indian Railways urgently needs to add capacity to these routes. In April 2005, India and Japan announced collaboration for feasibility and possible funding of the dedicated rail freight corridors, and RITES Limited was entrusted with the feasibility study of both eastern and western corridors. The feasibility study report was submitted to the Ministry of Railways in October 2007.

The Dedicated Freight Corridor Corporation of India Limited (DFCCIL) was incorporated by the Indian Ministry of Railways to undertake planning and development, mobilization of financial resources and construction, maintenance and operation of 'Dedicated Freight Corridors' or DFCs.

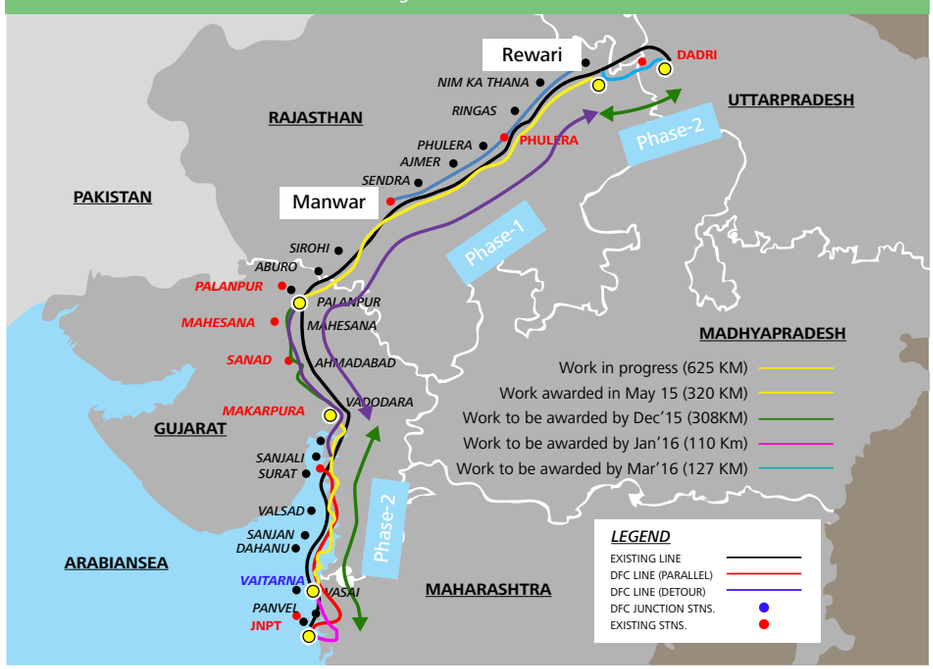
CURRENT STATUS

Golden Quadrilateral Freight Corridor (GQFC) consists of 6 DFCs: presently, two DFCs i.e. Western DFC & Eastern DFC is under implementation and funding for the remaining four has been approved in January 2018. The maps (in figures) show the alignment and length of both the corridors which are under-development. The 1st stretch of ~320 Km, between Rewari and Manwar, on Western DFC has been completed recently.

Dedicated Freight Corridor - Eastern Corridor



Dedicated Freight Corridor - Western Corridor



FEATURES OF DEDICATED FREIGHT CORRIDOR

Dedicated Freight Corridors are proposed to adopt world-class and state-of-the-art technology. The DFC under implementation will have the following features:

Infrastructure

SIGNALLING & TELECOMMUNICATIONS

1. Sophisticated train protection and warning systems
2. Centralized train management system
3. Global system and mobile communications for railways

CIVIL ENGINEERING

1. Mechanized track laying
2. Higher axle loads
3. Modern crossings/ turnouts
4. Friction buffer stop to enhance the safety

OTHER FEATURES

1. GPS-based real-time tracking system
2. Modern Supervisory Control and Data Acquisition (SCADA) and protection system
3. Computer simulation tools

Impact of Dedicated Freight Corridor (DFC)

- DFC is likely to provide time-table based freight services.
- Maximum container rake load on DFC - 360 TEUs as opposed to 90 TEUs at present.
- General rake load on DFC - 13000 MT as opposed to 3500 MT at present.
- Cost of operations on DFC will be about 45 paise per ton-Km as compared to the present cost of 95 paise per ton-Km.
- Eastern Dedicated Freight Corridor will meet Western Dedicated Freight Corridor at Dadri.

Feature	Existing	On DFC
Heavier Axle Loads		
Axle Loads	22.9t/25t	25 t Bridges and formation designed for 32.5 t
Track Loading Density	8.67 t/m	12 t/m
Maximum Speed	75 Kmph	100 Kmph
Grade	Upto 1 in 100	1 in 200
Curvature	Up to 10 degree	Up to 2.4 degree
Traction	Electrical (25 KV)	Electrical (25 KV at Feeding)
Station Spacing	7-10 km	40 km
Signaling	Absolute/Automatic with 1 km spacing	Automatic with 2 km spacing
Communicaton	Emergency Sockets/ Mobile Train Radio	Mobile Train Radio

Feature	Existing	On DFC
Moving Dimensions		
Height	4.265 km	7.1 m for Western DFC 5.1 for Eastern DFC
Width	3200 mm	3660 mm
Container Stack	Single Stack	Double Stack
Train Length	700 m	1500 m
Train Load	5,000 Ton	13,000 Ton

INDUSTRIAL CORRIDORS PLANNED ALONG DFC

The area within the radius of 150 Km along the DFC is demarcated as Industrial corridor. On Western DFC, Delhi-Mumbai Industrial Corridor (DMIC) is planned. It is a project for comprehensive infrastructure development to create India's largest industrial belt zone by linking the industrial parks and harbours of the six states between Delhi and Mumbai in order to promote foreign export and direct investment. Under the DMIC initiative, plans are also being implemented to create industrial parks and logistics bases with well-developed infrastructures in the area 150 kilometres to either side of the Western Corridor. Similarly, along the Eastern DFC, Amritsar Delhi Kolkata Industrial Corridor (ADKIC) is planned for developing an Industrial Zone spanning across seven states in India.

DFC will act as a key economic enabler and the two corridors will change the way goods are transported in India ■

Infrastructure

VCT Avenue In The East

Our team at Visakha Container Terminal handled over 0.45 million TEU during the financial year 2018/19.

They also achieved the highest exchange on a vessel, the most gate moves in a shift and the most ship moves per hour, and it dealt with out-of-gauge cargo efficiently. It was indeed overwhelming.

At VCT, we believe in putting our customers first, so while we always strive to improve our assets and technology to achieve higher efficiency and productivity, our most important effort has been to reach out to our customers to understand and meet their expectations.

As volumes at VCT are growing year on year, the utilisation of the facility is also reaching the maximum possible and the time has quickly arrived for us to expand the terminal. Moreover, the size of the vessels arriving at the port city, Visakhapatnam, will increase from 6,500 TEUs to 8,500 TEUs in the next 3–5 years and then to 15,000 TEUs eventually. Thus, to tackle these larger vessels, we need to enhance the equipment, extend the length of the quay, and develop new operational strategies. This extension of the existing container terminal will be known as VCT II.

VCT II will have three super post-Panamax cranes, nine eco-friendly rubber-tyre gantry cranes, five reach stackers and 24 tractor trailers geared to handle big ships. The terminal will have a 395-m-long quay and a back-up area for container storage and handling. It will be built on a BOT basis and the work order for extending the terminal was given to VCT by Visakhapatnam Port Trust on 2 March 2019. The new terminal will be commissioned within 2 years. The berth will be constructed in phases. The first 100 m of the quay will be ready in 6 months after commencing the construction of the berth and each additional 100 m will be added at intervals of 6 months. This will enable larger vessels to berth at VCT well before the entire project is completed. The entire 395 m of quay will be available for use by 2021.

The major driving factors for the increasing local volumes of 18–20 per cent per year include: companies expanding, increases in production and new industries being established. The global demand for ferroalloys has risen continuously, which has resulted in higher demands for its raw materials, manganese and chrome ores. Similarly demand for steel is growing too, increasing the need for refractory materials, scrap metals, ferronickel etc. Many of these products account for a major proportion of EXIM movements through VCT, which is expected to surge in the next 5 years. Not to forget, the pharma industries at the City of Destiny have driven growth as high as 50 per cent for chemical imports and pharma exports. The presence of Andhra Pradesh Medtech Zone is yet impetus in the export of medical equipment.

The other two driving factors – ICD (rail-bound) and trans-shipment – are vital to the growth of overall volumes. VCT II will have a major part in handling the envisaged growth. With this extension of the container terminal, the annual throughput of VCT will be 1.5 million TEU and it will have one of the longest quays in the country. The natural draft is 16.5 m, which can accommodate vessels of over 15,000 TEU in capacity.

VCT CFS

The container freight station at Visakha Container Terminal is on 34 acres. It is only 12 km from the container terminal and connected to it with a four-lane road that bypasses the industrial areas. It is a work environment that is a class apart in the industry. The site has been thoroughly tested with a 3000+ TEU of laden throughput.

VCT CFS uses advanced technology, the first to do so in Visakhapatnam. The CFS has an integrated office block, so that customs agents, customers and CFS personnel are all under one roof. The fully computerised gate complex, which provides operational flexibility along with a flexible multi-traffic flow, is unique as well. The intelligent layout, too, complements the operational flow and safety of people working in the facility. VCT CFS has two enclosed warehouses of 3000 m^2 and 2000 m^2 and one open warehouse to meet the requirements for specific types of cargo. The emptying and stowage of cargo is done by skilled workers, who prepare the goods for onward transportation. The inventory stored at the warehouse is extremely secure, as the CFS works 24 × 7 round the clock and there is sufficient surveillance, as it is a customs-bonded area.

VCT CFS is versatile and can handle a wide variety of cargoes. Being a unique facility with customised equipment, the CFS can fulfil the needs of many customers with their dynamic requirements. Bulk cargoes – in different forms and across various lanes – are containerised rapidly. Using its expertise and specialised equipment, VCT CFS can tackle manganese ore and chrome ore using trailer tilters, OOG cargo, rice using conveyor belts, newsprint using grabs and so on. Moreover, VCT CFS can deal with lightweight cargoes in 40' high cube containers, such as cotton, chillies and coir fibre

Technology

Implementing The IPA PCS1x In INDIA

An Honour And Privilege For PORTALL

Behind the scenes with the largest change management exercise currently being undertaken in the maritime and logistics arena in India.

The solution scope and challenges overcome

The tender was awarded by IPA in May 2018. The solution scope was to migrate the older version, launched in 2006 as PCS1.0, "as-is" to a cloud platform; and thereafter providing various value adds such as mobile application, interactive dashboards, 24x7 support wrapped around a modern and intuitive user interface. By doing this we were to expand the user base from the 7 stakeholders of the previous PCS to 27 stakeholders of PCS1x.

Migration of the old solution needed full access to updated business requirement documents, system requirement documents, source-code, technical components and the active database.

When the project execution commenced, it emerged that migrating was not feasible, however, thanks to the support received from the IPA and all their members as well as the proactive decisions of Portall management it was decided to re-build the port community system afresh. The rebuilt solution was focused on enhanced user experience and state-of-the-art user interface, besides the best in class enterprise service bus – the IBM ESB.

So while the scope increased the team managed to put together the entire solution within the stated timelines.

The Portall team worked round the clock on delivery, while IPA worked with the various trade associations on requirements and we saw that we completed the larger scope and were able to meet the launch date directive of the IPA and MOS of 11th December 2018.

The implementation related challenges faced and overcome

On the date of Launch , some back data was not available, and the apex associations were taken into confidence and requested for support to approve our going live regardless, thus entailing manual updates for missing data within a short period of time.

At Ports - UAT servers were not always available and they were quickly organized at Portall premises for all users and all IPA members assigned teams to visit and test onsite at Portall.

Differing Port operating systems and Terminal systems threw up need for alternate means of message delivery which were determined at short notice by the teams on both sides and delivered.

To enable payment on PCS1x banks needed to be onboarded again, and the last effort having been 10 years back, the banks and their local branches took a lot of time to get their IT readiness, protocols etc in place. Delays and errors from Banks meant an irate trade needed to work manually for a few weeks.

Through the active support of the IPA, The port nodal officers, the authorities at customs, JS Ports, and the various trade associations this difficult phase was overcome with relative ease.

SITPOS (Current situation position)

13 Major ports, 5 minor ports, 8 private terminals - onboarded

Customs / Concor / DGLL - onboarded

Total registered users on PCS1x – 6286

Technology

Messages moved in one day – 37691

Payments transacted in one day – Rs.19.86 cr (30th April 19)

TAT (turnaround time) for Customs messages – 3.2 min

TAT (turnaround time) for other messages – 0.8 sec

Change and perception management, the road ahead ...

The statistics shown above prove that Portall has indeed successfully effected delivery and performance of the PCS1x, as committed in the tender, we are now ready for on-boarding all twenty seven stakeholders to maximize the utility and transformation power of the platform.

The vision has a buy in from the entire ecosystem and now we need to overcome corporate inertia and all come aboard. Thereon we will need to drive the enhancements needed by stakeholders in a transparent and effective manner.

Some key perception issues encountered when speaking with the various important stakeholders of PCS -

Q: How can I allow a private company access to my Data? What is the Security of my data?

Ans: Data rests with IPA and is hosted by SIFY who were chosen for their prior experience and credentials with MietY and secure India based Servers. Several in-depth security protocols including data encryption, VAPT audits etc., have been put into place to ensure data is secure and tamper proof while in motion and while at rest.

Stringent process controls monitor who has access to the database and authentication controls and Security audits ensure that the activity is authorized by IPA. More information is on the IPA website for reference.

Q: I have managed this way for so long, I have small local solutions to these problems – why do we all need to embrace one platform?

Ans: The PCS if fully adopted in India will revolutionize the way we do business in this country and show a sizable improvement in our LPI, aid all EXIM businesses to grow and usher in an age of full digitization for the industry.

The ills of fragmented systems are well known, the costs of the change have been consciously kept very low – we really need to embrace the change for our own benefit and that of the final user – the exporter and importer, the consumer.

Q: Is IPA or some other body trying to gain control ? Will it hurt my current business?

Ans: The story and value of the Indian PCS is far beyond its creators, whether IPA or Portall, the Govt of India recognizes the immense transformation power of the platform and wants to mandate usage by all ports and terminals in India.

There are several nations that have successfully adopted a PCS and we have studied and learnt from many. We are prepared to add value to all 27 identified stakeholders of the Indian PCS and look forward to doing more on a continual basis.

It is an open platform and will infact encourage and nurture smart tech startups that want to serve the Maritime ecosystem.

Come join PCS1x

If you are a freight forwarder, a customs house broker, a 3PL logistics company, a CFS/ICD operator, a Port / terminal operator, a Transporter, a Rail Haulier, a Steamer agent, a shipping Line, an NVOCC, a Customs official or any other player in the Maritime ecosystem of India, the PCS1x has something of value to offer you.

Portall is running a campaign titled # All aboard in 90 days as the first of many sprints to get maximum adoption of the PCS.

During this campaign we will get the maximum number of companies and associations to commence using the PCS, and parallelly we will produce a road map of multiple value additions and new features for the better good of the trade and to bridge the gap between PCS1x and its own successor, thus future proofing the platform.

The learnings gained in the PCS 1x journey, from the tender award to the current high paced campaign have been invaluable and Portall indeed feels honored to be tasked thus.

Contact the Portall team today if you would like to be a facilitator to full adoption of the PCS1x ■

Technology

Waste To Energy

Waste to Energy (WTE) is a term that is used to describe various technologies that convert non-recyclable waste into usable forms of energy including heat, fuels and electricity. WTE can occur through several processes such as incineration, gasification, pyrolysis, anaerobic digestion, and landfill gas recovery.

Major Types of Waste to Energy methods

1. The term WTE is commonly used in specific reference to **Incineration** which burns completely combusted waste at ultra-high temperatures allowing for energy recovery. Modern incineration facilities use pollution control equipment to prevent the release of emissions into the environment.

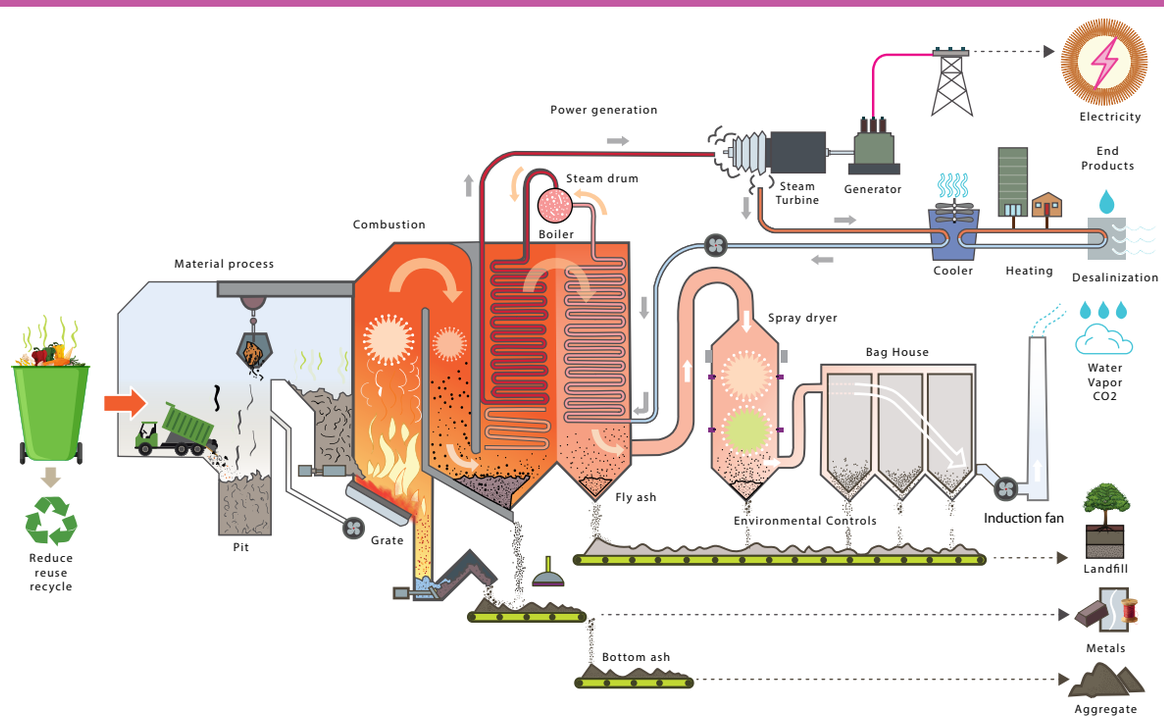
2. Another example of WTE is **Anaerobic digestion (AD)**, technology that biologically converts organic material into compost as well as biogas for energy. It is a biological conversion process which is carried out in the absence of an electron acceptor such as oxygen. The main products of this process are an effluent (or digest) residue and an energy-rich biogas. The obtained biogas can be used either to generate power and heat or to produce bio-fuels.

3. **Pyrolysis** is another WTE process that thermally decomposes biomass by heating it at elevated temperatures under controlled inert conditions (i.e., very little O_2 or under an inert gas atmosphere such as N_2). In simple terms, it is the process of heating organic material at high temperatures in the absence of oxygen. Since no oxygen is present, the organic material does not combust. Instead, the chemical compounds (i.e. cellulose, hemicellulose and lignin) that make up the material decompose into combustible gases and charcoal. Pyrolysis transforms organic materials into their gaseous components, a solid residue of carbon and ash, and a liquid called pyrolytic oil (or bio-oil). Pyrolysis is a useful process for treating organic materials that "crack" or decompose under the presence of heat; examples include polychlorinated biphenyls (PCBs), dioxins, and polycyclic aromatic hydrocarbons (PAHs).

Why Waste to Energy?

The problems caused by solid and liquid wastes can be significantly mitigated through the adoption of environment-friendly waste to energy technologies that will allow treatment and processing of wastes before their disposal. Waste to energy generates clean, reliable

Typical Process Flow Diagram for Waste to Energy



Technology

energy from a renewable fuel source, thus, reducing dependence on fossil fuels, the combustion of which is a major contributor to GHG emissions. These measures would reduce the quantity of wastes, generate a substantial quantity of energy from them, and greatly reduce pollution of water and air, thereby offering several social and economic benefits that cannot easily be quantified. In addition to energy generation, waste-to-energy can fetch significant monetary benefits. Some of the strategic and financial benefits from waste-to-energy business are:

- ***Profitability*** - If the right technology is employed with optimal processes and all components of waste are used to derive value, waste to energy could be a profitable business.
- ***Government Incentives*** - The government of India already provides significant incentives for waste to energy projects, in the form of capital subsidies and feed in tariffs.
- ***Related Opportunities*** - Success in one sector could lead to opportunities in other waste such as sewage waste, industrial waste and hazardous waste. Depending on the technology/ route used for energy recovery, eco-friendly and "green" co-products such as charcoal, compost, nutrient rich digestate (a fertilizer) or bio-oil can be obtained.
- ***Emerging Opportunities*** - With distributed waste management and waste to energy becoming important priorities, opportunities exist for companies to provide support services like turnkey solutions. In addition, waste to energy opportunities exist not just in India but all over the world. Thus, there could be significant international expansion possibilities for Indian companies like Arya Water Technologies (AWT).

Waste to Energy Market

The global waste to energy market was valued at $17,271.4 million in 2017, and is projected to reach $27,700.8 million by 2025, growing at a CAGR of 6.1 percent from 2018 to 2025. The surge in the investments by various governing bodies, specifically in the developing nations of Asia-Pacific, such as China and India, coupled with rapid urbanization and significant growth in consumer expenditure capabilities are expected to drive the global waste to energy market. In India, According to the Ministry of New and Renewable Energy (MNRE), there exists a potential of about 1700 MW from urban waste (1500 from MSW and 225 MW from sewage) and about 1300 MW from industrial waste.

Indian Reference -
In a PPP initiative, a Waste to Energy plant has been set up in North India, which receives more than 2000 tons per day of municipal solid waste. An elaborate seven-stage pre-processing section in the plant converts waste to Refuse Derived Fuel of high calorific value. Set up to initially process 1300 tons per day (TPD) of municipal solid waste and generate 12 MW of Green Power, the plant is built with a capacity to process 2000 TPD of waste.

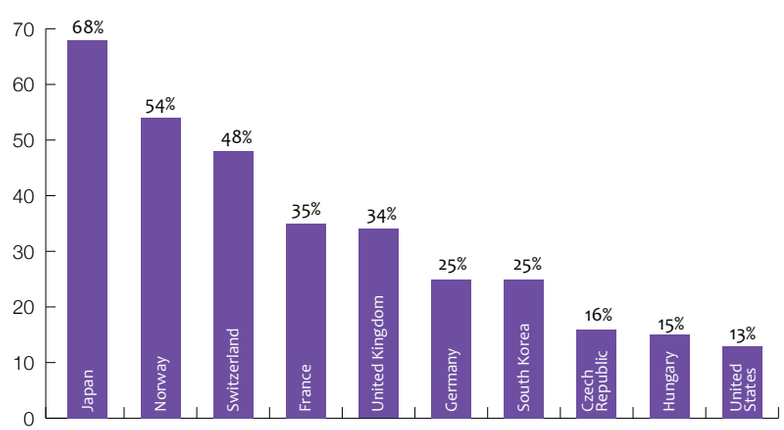
Global References - Afval Energie Bedrijf CHP plant in Amsterdam, in operation since 2007, is the largest incineration plant in the world (114.2 MW) and can process 1.5 million tonnes of MSW per year with an electricity generation efficiency of 30 percent.

The Likeng WTE plant at Guangzhou, China has a design capacity of 1,040 metric tons per day and generates 130,000 MWh of electricity a year, by treating 10 percent of the post-recycling MSW of Guangzhou City.

Arya Water Technologies & Waste to Energy

Having said this, Arya Water Technologies (AWT) is actively looking at prospects to foray into the Waste to Energy Market initiatives, primarily Pyrolysis. Potential can be tapped with technology selection, techno economic feasibility analysis and creation of a trained pool of specialists. AWT has already supplied 3 plants based on the anaerobic digestion process, where the organic wastewater is converted into biogas which can be further used. Two of these plants are in India and another plant is under construction at Lusaka in Zambia, Africa ■

Percent of total municipal sold waste that is burned with energy recovery in selected countries



Note: Data for Japan, South Korea and United States are for 2015. Data for other countries are for 2016.

Source: Organization for Economic Co-operation and Development, excluding United States as of December 2018; for United States, U. S. Environmental Protection Agency, July 2018

In Focus

IMO 2020: Reducing Sulphur Emissions From Ships

IMO 2020 is the popular topic in the maritime fraternity as the industry braces to implement the new Sulphur Cap Guidelines on Buner Fuel coming into effect from 1st January 2020. This resolution adopted at the 70th meeting of the IMO's Maritime Environment Protection Committee held in October 2016, limits the Sulphur content in marine fuels to 0.5 per cent from 3.5 per cent that is presently allowed.

The Global Fuel Sulphur Cap is part of the IMO's response to controlling harmful emissions from ships. This resolution was first adopted by IMO in the year 1995, whereby effective from January 2005, the Sulphur content in bunker fuel was limited to 4.5 per cent. This limit was further lowered to 3.5 per cent in 2012 and is the one prevailing limit now. The IMO had also designated few geographic areas as Sulphur Emission Control Areas (ECA) where Ships have to burn bunker fuel with a sulphur content of no more than 0.1 per cent. This has been in effect since 1 January 2015 and includes geographies like Baltic Sea, the North Sea, parts of the North American and the US Caribbean Sea.

In international shipping, majority of the Merchant Ships use heavy fuel oil (HFO) which is the traditional source of energy to power ships and accounts for over 70 per cent of all Bunker fuels. The rest is Low-Sulphur Marine Gas Oil (MGO) with below 0.5 per cent of Sulphur content and the Ultra Low Sulphur Fuel Oil (ULSFO) with below 0.1 per cent of sulphur content used in ECAs. The new resolution is, therefore, going to impact a huge part of the maritime industry and has sent the entire Shipping industry as well the Bunker Oil Supplying industry into a quandary as to how would things evolve post 1st January 2020. There have been series of papers written as well as discussions happening at various forums as operators are running against the clock to meet the deadline.

For compliance,

Shipowners have the following three options:

- Use Low Sulphur Fuel (LSF) or Marine Gas Oil (MGO) containing less than 0.5 per cent of Sulphur content.
- Continue to use the Heavy Fuel Oil and install Scrubbers in the ships which would capture the Sulphur content from exhaust fumes
- Use LNG as bunkers

None of the above is an easy solution which can be adopted at the switch of a button and hence, the confusion and the distress in the industry. The problem is compounded further by the fact that Shipping industry has been going through a phase of depressed freight rates in the last few years and Shipping companies are not generating large cash surplus to increase their capital or operational expenses at this point of time.

The way ahead with either of the options

A. Heavy Fuel consumption by ships was about 3.5 million barrels per day in 2018 (about 175 million tonnes for the full year). In case, the entire world fleet of merchant ships switch over to Low Sulphur Fuel, the world refining capacity is not geared to produce so much of clean fuel from 1st January. Refineries worldwide have been looking at high Sulphur fuel sales as a way of disposing of their Sulphur residues in the distillation chain. With a stoppage of such sales from January 2020, Refineries will have to find a way to dispose off their Sulphur residues. Hence, this is going to change the entire Bunker oil Refining and Marketing chain. Although, major Oil Companies have confirmed that they would be able to supply the Low Sulphur Fuel from end of 2019 and Shipping Companies need not worry about supplies, industry experts still doubt on seamless availability of this fuel in all geographies.

Apart from the supply worries, cost of LSF is the biggest concern Ship operators have. Presently MDO is far more expensive than HFO and if Ships are going to use MDO or LSF for their ocean voyages, Operational costs for Shipping Companies are going to sky rocket. As is well known, Bunker costs are the single largest cost head during vessel operations and the switch over to LSF or MDO is going to increase costs for Ship operations. How much of this increase can be passed over to the Trade in terms of increase in freight is yet to be seen, but the fact remains Logistics costs of Goods are set to increase post January 2020.

B. The second option for Shipowners to install Scrubbers on their vessels which would

In Focus

capture the Sulphur emissions from the exhaust gases limiting its content to prescribed limit, whilst continuing to burn Heavy oil as Bunkers. This technology works by spraying alkaline water into a vessel's exhaust which removes Sulphur and other unwanted Chemicals. This innovative concept is easier to speak than to be put in motion. Scrubbers can be of two types - Closed loop and Open loop. A Closed loop Scrubber would capture all the excess Sulphur from exhausts and then this Sulphur would be disposed off at Port receiving facilities during the vessel's call at Ports. Whereas an Open loop Scrubber would capture the excess Sulphur from the exhaust gases and would then dispose-off the captured Sulphur in smaller quantities during its voyage in high seas, which is permissible under international laws. There have been many concerns on use of Open loop Scrubbers as its going to pollute the Ocean where the Sulphur is discharged. Many countries have announced that they would not be accepting Vessels to operate Open loop Scrubber within their territorial limits. Hence a vessel fitted with Open loop Scrubber would have to switch over to LSF or MDO during calls at these restrictive ports.

Whilst the above are operational difficulties in usage of Scrubbers, the first problem is installation of Scrubbers on vessels, whether Closed or Open loop. Fitting a Scrubber in a new vessel under construction is simple as the Engine room layout can be designed that way. However, for existing vessels, finding out space within the engine room for fitting a Scrubber has been a major challenge. Next, even if the Engine layout within a vessel can be modified, finding adequate number of Repair Yards which can carry such modification for the huge number of world fleet has been a major challenge. Fitting a Scrubber on an existing vessel can take anywhere between one month to four months at a shipyard/repair yard. That means an exiting drydock can refurbish a maximum of 12 vessels in a year and if the entire world merchant fleet were to install Scrubbers, it would take years to complete such mammoth project.

Finally, the most difficult issue on fitting Scrubbers is the financial viability. A ballpark figure on fitting a Scrubber is anywhere between USD 2 million to 8 million, depending upon the size of vessel and location of yard. In the prevailing depressed freight market scenario, such a huge investment may not be justifiable and shipowners are averse to investing this additional amount on their vessels looking at the cost–benefit analysis. It is difficult to predict if the freight earnings would increase post January 2020, to compensate for this additional capital cost. In case the vessel is old with a short balance life, amortising this additional cost over the balance life can be a challenge. In case the vessel is operating on a trade segment where the voyages are short and port stay is longer, it does not make sense to invest in installation of Scrubbers. Hence there are many dynamics affecting this option and not many shipowners are therefore going for this option for their existing fleet.

C. The Third option shipowners have is to switch to LNG as bunker fuel. Ships can switch over to LNG as bunker fuel with minimal change to their engines and LNG is the cleanest fuel any vessel can use. However, this again is not a viable solution as there is no LNG bunkering infrastructure available worldwide today. LNG bunkering infrastructure is at an infant stage today as most LNG-powered ships are mainly coastal vessels limited to European waters. There continues to be interest in many other countries in developing LNG bunkering infrastructure, but such development cannot come up in the short term. There is a need to set up entire Supply Chain logistics, increase Storage Space, set up facilities at Ports, Pipelines, etc. Building up such LNG supply infrastructure is far more complex and expensive than building normal Bunker fuel supply infrastructure, hence this option may not be a viable option for majority of the world fleet.

Time is running out for Shipping industry to opt from one of the above solutions and due to the lack of clarity on how the freight markets would react to this new regulation, majority of the players are likely to adopt burning Low Sulphur Fuel rather than going for expensive retrofitting of Scrubbers on existing fleet. As of date, very few shipping companies have gone in for Scrubbers on their existing fleet. Going ahead the new buildings may be fitted with Scrubbers and the existing fleet continue with same Engine set ups. Thus, there would be a mix of HFO and LSF bunker requirements of the shipping industry. Whether this would mean a differential freight rates for vessels burning HFO vis-à-vis vessels burning LSF, is a question difficult to answer at this point of time ■

Port Statistics

SHIPPING & CARGO PERFORMANCE

QUARTERLY UPDATES ON INDIAN MAJOR & MINOR PORTS (QTY IN MILLION TONNES)

JANUARY - MARCH 2019 (IVth QUARTER) 2018 - 2019 / JANUARY - MARCH 2018 (IVth QUARTER) 2017 - 2018 (QTY IN MT)

AGRICULTURAL PRODUCTS

	SUGAR		SOYAMEAL		WHEAT		RICE		MAIZE	
	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18
No. of Ships called	36	20	16	5	0	2	33	36	1	1
Total Cargo Handled	1.019	0.533	0.507	0.139	0.000	0.052	0.587	0.624	0.059	0.002
Import	0.099	0.321	0.040	0.000	0.000	0.052	0.000	0.017	0.059	0.000
Export	0.920	0.212	0.467	0.139	0.000	0.000	0.587	0.606	0.000	0.002

FINISHED FERTILIZERS & FERTILIZER RAW MATERIALS

	UREA		SULPHUR		ROCK PHOSPHATE		DAP		MOP	
	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18
No. of Ships called	49	27	18	22	55	37	29	14	31	33
Total Cargo Handled	2.322	0.984	0.611	0.575	2.173	1.761	1.088	0.450	1.024	0.992
Import	2.277	0.984	0.508	0.196	2.173	1.761	1.070	0.442	1.024	0.992
Export	0.045	0.000	0.103	0.379	0.000	0.000	0.018	0.008	0.000	0.000

COAL

	THERMAL COAL		COKING COAL		MET COKE		PET COKE		ANTHRACITE COAL	
	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18
No. of Ships called	243	299	264	171	29	27	43	40	11	8
Total Cargo Handled	13.682	16.775	10.900	10.549	0.707	0.740	2.047	1.973	0.281	0.168
Import	5.615	7.553	10.655	10.163	0.668	0.718	2.044	1.163	0.281	0.168
Export	8.067	9.222	0.245	0.161	0.039	0.022	0.003	0.810	0.000	0.000

STEEL & RELATED ORES

	STEEL PRODUCTS		SCRAP METAL		CHROME		MAGNESIUM ORE		IRON ORE	
	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18
No. of Ships called	322	323	1	2	1	2	18	27	262	296
Total Cargo Handled	3.871	3.977	0.050	0.042	0.010	0.019	0.524	0.503	15.750	20.875
Import	1.997	1.931	0.050	0.042	0.000	0.000	0.502	0.479	7.024	8.425
Export	1.874	2.046	0.000	0.000	0.010	0.019	0.022	0.024	8.726	12.450

INDIAN PORT PERFORMANCE - Q4 & FY 2018 - 19 THROUGHPUT (QTY IN MILLION TONNES)

JANUARY - MARCH 2019 (IVth QUARTER) 2018 - 2019 / JANUARY - MARCH 2018 (IVth QUARTER) 2017 - 2018 (QTY IN MT)

Ports	Types of Ports	NO. OF SHIPS		LIQUID CARGO		BULK CARGO		CONTAINERS (TEUS)		TOTAL CARGO *	
		IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18	IVth Qtr'19	IVth Qtr'18
Kandla	■	328	371	3.246	2.720	8.769	4.963	84,106	5,252	12.015	7.683
Mumbai	■	341	452	6.696	6.817	1.849	1.423	-	9,000	8.545	8.240
Nhava Sheva	■	325	170	1.701	1.974	0.000	0.303	1,322,489	1,118,113	1.701	2.277
Mormugao	■	238	189	0.274	0.276	5.551	7.032	-	-	5.825	7.308
Mangalore	■	510	347	6.962	7.001	2.877	3.610	-	-	9.839	10.611
Cochin	■	225	179	6.135	5.095	0.435	0.260	167,665	124,228	6.570	5.355
Tuticorin	■	180	237	0.328	0.420	4.037	5.702	187,138	170,739	4.365	6.122
Chennai	■	357	229	3.793	3.770	1.351	1.263	385,303	371,321	5.145	5.033
Ennore	■	217	214	0.881	1.210	5.772	6.589	33,131	-	6.653	7.799
Vishakhapatnam	■	390	269	3.221	2.161	8.906	6.958	109,585	89,219	12.128	9.119
Paradip	■	662	471	9.742	8.415	18.818	20.015	-	-	28.559	28.430
Haldia	■	662	510	2.604	3.231	6.475	6.650	42,859	46,886	9.079	9.881
Kolkata	■	48	26	0.286	0.301	0.084	0.001	152,291	108,674	0.370	0.302
Gangavaram	■	73	4	0.000	0.000	4.643	0.147	-	-	4.643	0.147
Pipavav	■	170	128	0.086	0.209	2.197	1.550	219,460	46,886	2.282	1.759
Mundra	■	752	747	0.000	7.315	12.835	8.411	1,173,079	108,674	12.835	15.726
Dahej	■	228	182	0.971	6.013	2.772	2.160	-	-	3.743	8.173
Hazira	■	244	165	0.965	1.032	6.124	1.795	142,850	113,918	7.089	2.827
Navlakhi	■	54	54	0.000	0.000	4.665	2.935	-	-	4.665	2.935
Kakinada	■	251	172	0.751	0.634	3.534	2.137	5,018	-	4.285	2.771
Total Vessel Calls at all ports		**6255**	**5116**	**48.642**	**58.594**	**101.693**	**83.904**	**4,024,974**	**2,312,910**	**150.335**	**142.498**

■ Major Port ■ Non-Major Port

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

J M BAXI GROUP

www.jmbaxigroup.com

J. M. BAXI & Co.	ULSSLLP	ARYA OFFSHORE	ICT	VCT
www.jmbaxi.com	www.unitedliners.com	www.aryaoffshore.com	www.ict.in	www.vctpl.com

BOXCO LOGISTICS	DIABOS	PORTALL	ARYA COMM	ARYA WATER
www.boxcologistics.com	www.diabos.biz	www.portall.in	www.aryacom.com	www.aryawater.com

BOXCO

portall

ARYACOM

ARYA WATER TECHNOLOGIES