Conference on
Modern Logistics for Indian Metals &Minerals

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Optimizing Inbound & Outbound Logistics

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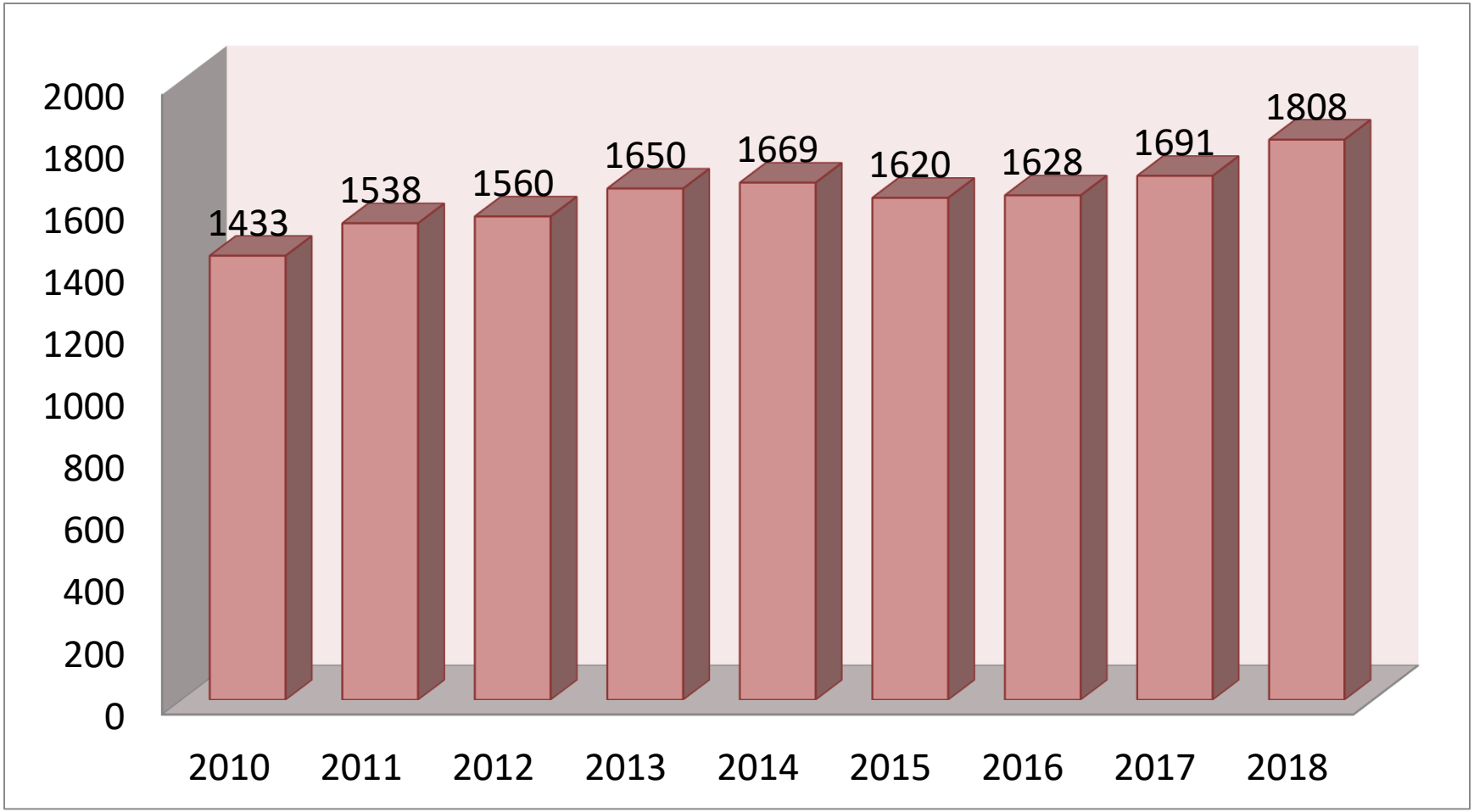
World Steel Scenario

World Steel Production (MMT)



World Steel Production is on the rise in 2018

Global Developments

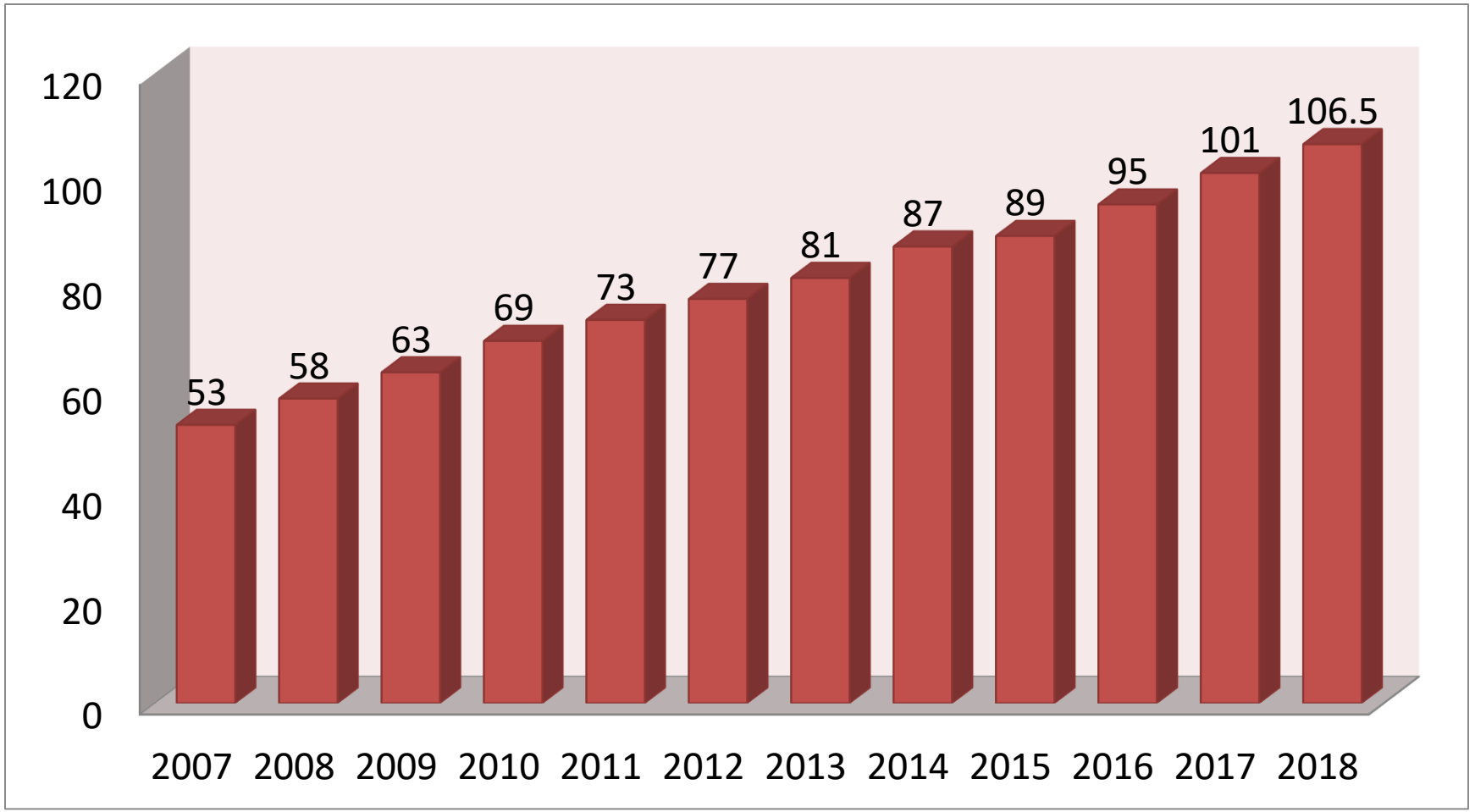
- China driven upsurge in capacity till 2014. From then growth in China slowing down.
- We expect global growth to continue in short to medium term. 2018 has witnessed a growth of 4.6% in steel production globally.
- Total steel production reached at 1.8 Bn tonnes out of which China contributes 928 MMT and rest of the world 880 MMT.
- India has improved to 2nd position by clocking 106 MMT (4.9% growth)
- South Korea's steel demand is suffering from weakening construction and a depressed shipbuilding sector.
- ASEAN remains a high growth region, especially Vietnam and the Philippines, while more mature economies such as Thailand and Malaysia are showing slower growth.
- India has better prospects due to accelerating government reforms leading to growth in the coming years.

- **Future – indication of sustained growth in developing country**

Rank of Countries in Steel Production

	2018		2017	
Country	Rank	Crude Steel Production	Crude Steel Production	% 2018/ 2017
		(MT)	(MT)	
China	1	928.3	870.9	6.6
India	2	106.5	101.5	4.9
Japan	3	104.3	104.9	-0.3
United States	4	86.7	81.6	6.2
South Korea	5	72.5	71.0	2.0
Russia	7	71.7	71.5	0.3
Germany	7	42.4	43.3	-2.0
Turkey	8	37.3	37.5	-0.6
Brazil	9	37.7	34.4	1.1
Iran	10	25.0	21.2	17.7

Crude Steel Production in India (Million tons)- last 10 yrs

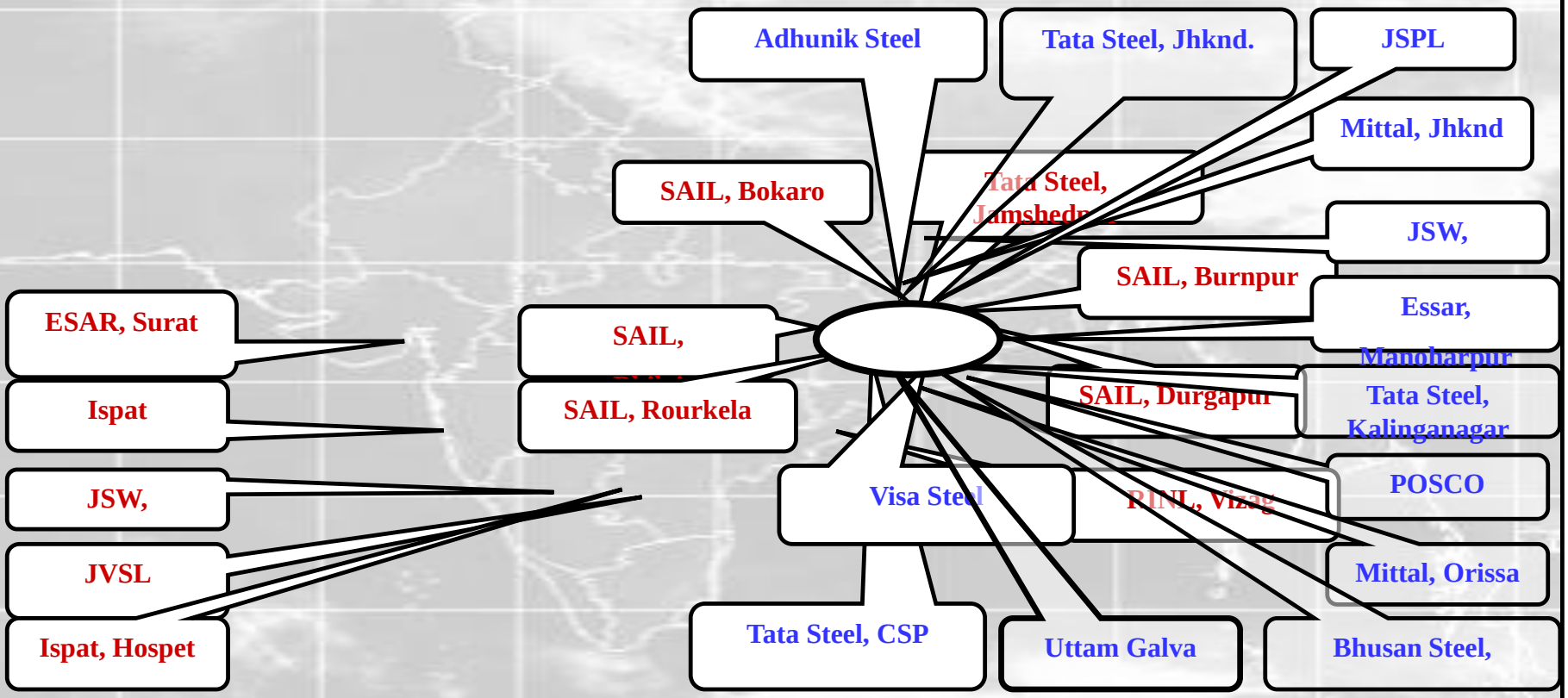


Indian Steel Industry

- India is the world's second largest steel producer in 2018. India's crude steel output grew 4.9% year-on-year to 106.5 Million Ton in CY 2018.
- Government of India approved the National Steel Policy (NSP) 2017, to create a globally competitive steel industry in India. NSP 2017 targets 300 million tonnes (MT) steel-making capacity and 160 kgs per capita steel consumption by 2030 as against the current consumption of 61 Kgs.
- The policy also envisages to domestically meet the entire demand of high grade steel, electrical steel and alloys for strategic applications and increase domestic availability of washed coking coal so as to reduce import dependence on coking coal.
- Going forward, the accelerated spend in infrastructure sector, railways, development of domestic shipbuilding industry, opening up of defence sector, growth in automobile and capital goods industry and the construction in urban & rural areas, are expected to create significant demand for steel in the country.
- Majority planned expansion are in Eastern India putting excessive pressure on exiting logistics infrastructure due to concentration.

Focal Point of Growth of Steel Mills

Major steel plants located in three states rich in coal and iron ore, putting pressure on port & other logistics infrastructure for both Import & Export.



Typical Inbound / Outbound Logistics-steel

PLANTS

1ST LEG

Finished Steel

MAJOR RAIL 95% / MINOR ROAD 5%

CUSTOMERS

WAREHOUSE

2ND LEG

MAJOR ROAD 98% / MINOR RAIL 2%

SMALLER WAREHOUSE

CUSTOMERS

3RD LEG

100 % ROAD

CUSTOMERS

SEA / RAIL

Coking Coal

Iron Ore, Other material

RAIL

Logistics in Steel Industry

Logistics in Steel Industry:

- Steel industry is traditionally a very boom-and-bust cyclical industry.
- Steel Industry is facing logistics constraints in the movement of raw materials and end products which remains a challenge in Medium to long term.
- Generally, 1 ton of steel output requires handling and transportation of around 4 tons of bulk materials.
- Therefore, logistics play a critical role in determining the operational efficiency and cost structure of a steel producer.
- As a historical industry, there have been two major obstacles to steel industry-
  - Higher input cost of raw materials.
  - Lack of visibility across the entire steel supply chain and role of each participant in the chain.

Logistics Infrastructure for Steel Industry in India

- Major dependence on Indian Railway as most of the plants are located in hinter land.
- Bulk commodities like iron ore , Coal, fluxes, move almost by rail.
- Presently, around 50-60% of the domestically produced steel moves by rail.
- Coastal movement in India is not well developed.
- Bottlenecks in reaching and also evacuation of cargo from the ports.
- Inland waterways in a nascent stage.
- Infrastructure development being accorded priority by Government and industry.
- **The competitive advantage between companies is going to be determined by the logistics cost**

Development in Logistics Infrastructure for advantage of Steel Industry

- **Ports :**
- Capacity expansion through construction of berths, exclusive coastal berths under Sagarmala programme
- New Ports : Dhamra, Gangavaram, Krishnapatnam, Gopalpur, Kakinada will play a big role to support exim logistics for Steel Industry in east coast
- Major ports such as Kolkata, Haldia, Tuticorin, Madras, Cochin, Kandla, etc. have right infrastructure for handling coastal trade along with other minor ports.
- **Inland waterways:**
- **NW1** - longest waterway from Allahabad to Haldia, great potential for hinterland connectivity.
- **NW5** - close to Talcher-Paradip region, for evacuation of coal and iron-ore.
- **NW4** - connecting coastal parts of Andhra and is important for development of new industrial hinterlands under Visakhapatnam-Chennai Industrial Corridor.
- **NW2** - Potential to cater to the traffic in the north eastern region.
- Indo-Bangladesh Protocol Route to connect North East

Indian Railways – development to help Steel Industry

- Suffering from Congested Track/ high density of traffic, Low turn around
- Modernization and upgradation of equipment-both fixed infrastructure & rolling-stock
- Doubling and Port Connectivity (Projects undertaken by IPRCL)
- Dedicated Freight Corridors will be a game changer in rail transportation.
- FOIS : Real time information system on rake movement
- Large investment under PPP route – Logistic Parks/ Hub
- General Purpose Wagon Investment Scheme/ SFTO scheme
- Steel Movement by Rail : Presently ~ 50% , to be improved

Slurry Pipeline- Alternative to Bulk Transportation.

- Slurry transportation of iron ore concentrate through pipelines is an environment friendly method for ore transportation.

- The Indian government has set a target to increase India's steel output to 300 million tonnes by 2030. The proposed projected growth of steel industry would impart tremendous pressure on railways with respect to inward and outward traffic, loading and evacuation of raw materials & finished products. Development of slurry transportation facilities is a more feasible option in the mining areas.

- The exiting slurry pipelines of Essar Steel has provided cost effective measure of ore transportation to pellet plants. There are two on-going slurry pipeline projects of NMDC and other steel makers. SAIL is also identifying some route under this option.

- Iron ore transportation through slurry pipelines has brighter prospects in India and gradually more steelmakers may look at it as a more convenient option for iron ore supply from mine heads.

Steel Cargo Perspective (Mode Optimisation)

- For steel sector, challenges are two fold involving inward and outward movement
- The decision to shift cargo from rail/road to coastal/IWT will depend on the ability of the service provider to reach material of a reasonable size at a optimum cost and at right time.

	RAIL	ROAD	Coastal/ IWT
Cost	Medium	High	Cheap
Batch size	Large	Small	Large/ Medium
Door to door	Limited	High	Limited
Speed	Medium	Fast	Slow

Integration and partnership across members of logistics value chain is essential

Latest developments in logistics and supply chain process

- Globalization of economies and advent of data-driven technology have made supply chains more sophisticated. Several **key drivers** are :

- **E-Commerce: E**-commerce has shaped how consumers today purchase products. Whether our company serves consumers or other businesses, the continued growth of e-commerce will have an impact on our supply chain.

- **Information Technology** will enable our supply chain to operate more autonomously - with less human management or intervention. Ex: RFID sensors

- **Workforce: P**artnering with a third-party logistics (3PL) company could a necessary alternative to bringing transportation experts in-house. Application of AI and advanced robotics has become a reality.

- **Block Chain & IOT:** Logistics industry is searching for new technologies in order to improve the existing processes, cut costs and increase the transparency of the supply chain. The block chain technology offers a solution to most current issues.

- The IOT creates new challenges associated with connected devices. Physical flow of goods can be more effectively orchestrated and synced with information and financial flows when block chain is combined with the IoT.

- **IoT use in logistics industry can help in Location management systems, Inventory tracking and warehousing.**

SAIL- The Organisation

- SAIL's present level of Production is 16 MMT, going upto 23 MMT by 2020-21. SAIL has entered 60th year of production.
- SAIL has chalked out its long term vision 2030 to raise steelmaking capacity to 52 MMT as part of Govt's new National Steel Policy to achieve 300 MMT of production in India.
- SAIL imports approx. 15 million tonnes of Coking Coal at present which is likely to go up to 18 million tonnes by 2019-20.
- Apart from Coal, SAIL also imports sizeable quantity of other raw materials like Limestone, plant and machineries for regular consumption. through East Coast ports.
- SAIL exports finished steel to various overseas countries through East Coast ports.
- The major issues confronting SAIL and steel industry as a whole are inadequate port facilities and infrastructure, lack of integrated logistic services etc.

SAIL Vision 2030 - Volume of Logistics

Major Raw Material – consumption & requirement and Finished Steel

Unit: Million Tonnes

	Actual 2017-18	After Ongoing Expansion 2020-21	In 2030
Hot Metal	**16.0**	**23.0**	**52.5**
Raw Materials Requirement			
Iron ore	27	39	87
Limestone	5	5	13
Dolomite	3	4	10
Coking Coal +Boiler Coal	20	23	71
Total RM	**54**	**71**	**181**
Outward Despatch	**13**	**20**	**42**
Total Rail Traffic	**67**	**91**	**223**

* Import of dry bulk is expected to be around 37 million tonnes per annum beyond 2030

SAIL's Strategy to Optimise Inbound & Outbound Logistics

SHORT TERM:

- Wherever possible Push-Pull / EOL system may be accepted for better utilization of available rakes.
- Preferably Single Point rakes may be planned for steel despatch for ease of allotment and faster turn round.
- Explore possibilities of Road transportation / alternate mode of transportation (Multi-modal) i.e. Coastal Shipping as a regular strategy to insulate from over dependence on railways.
- **MEDIUM TO LONG TERM :**
- Wagon procurement through GPWIS (wagon investment scheme) to get additional rakes.
- Explore possibilities of alternate mode of transportation like slurry pipeline, inland waterways etc.
- To generate facilities to handle multiple type of wagons for raw materials, like handling of coal in BOBRN wagons in hopper, flexibility of handling varying height wagons in tipplers, etc.
- Full Length siding for shipping of iron and steel materials for loading with separate despatch yard at plants

LTTC Agreement of SAIL with Railways

- Long term traffic volume & freight revenue commitments from the customers.
- Stability and certainty of freight rates to the customers and assured supply of wagons.
- Generation of additional traffic volumes and revenues for railways.
- Freight Rebate on Incremental as well as Retention of Traffic to customers.
- Freight escalation protection to the customer during any particular contractual year.
- Commodities: Iron & Steel, Pig Iron, Limestone, Dolomite etc.
- Coal & Iron ore is excluded which also needs to be covered by Railways.

Future Outlook & Way Forward

- India will have strong steel demand in coming years and Steel making capacity to grow manifold
- Maintaining economic growth with existing port/ logistics infrastructure will create bottleneck
- More PPP projects might be an effective rational approach to quickly build facility and also bring in efficiency
- Participation of Steel Industry in Infrastructure Projects to be encouraged
- Application of new technology like Block Chain/IOT in supply chain would make the chain more visible. In India, particularly in steel section the application is yet to catch up. But this would the future requirement.
- **Coordinated growth/ developments amongst all sector is the need of the hour.**

Thank You