



# *Global Current Trend and Scenario of Refractories*



***REFIS 4.0***  
***Bokaro : 23/09/2022***

- *Global Economy Projection & Position of India*
- *Refractory Demand Drivers & Growth Prospect*
- *Global Trend of Refractories*
- *Key Challenges for Refractories Industries*
- *Preparedness of Refractories Industries*



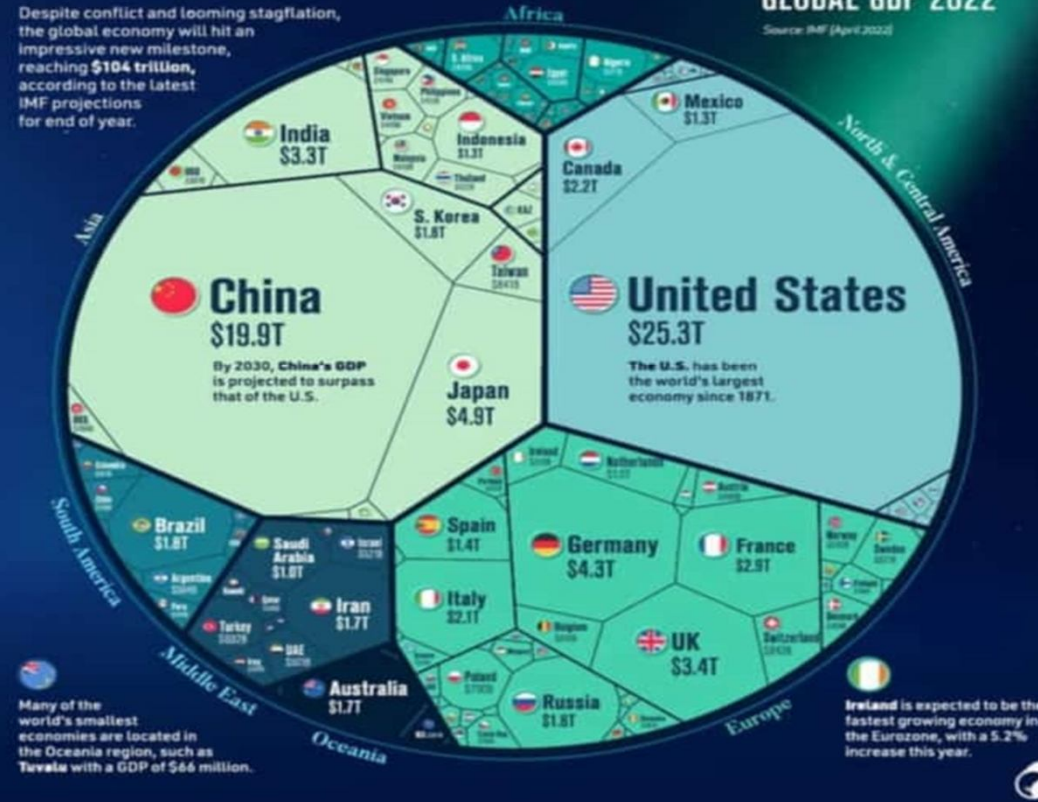
***Global Economy Projection &  
Position of India***

# Position of India in Global Economy

## The \$100 Trillion World Economy GLOBAL GDP 2022

Despite conflict and looming stagflation, the global economy will hit an impressive new milestone, reaching **\$104 trillion**, according to the latest IMF projections for end of year.

Source: IMF (April 2022)



WORLD ECONOMIC OUTLOOK UPDATE JULY 2022

## GROWTH PROJECTIONS

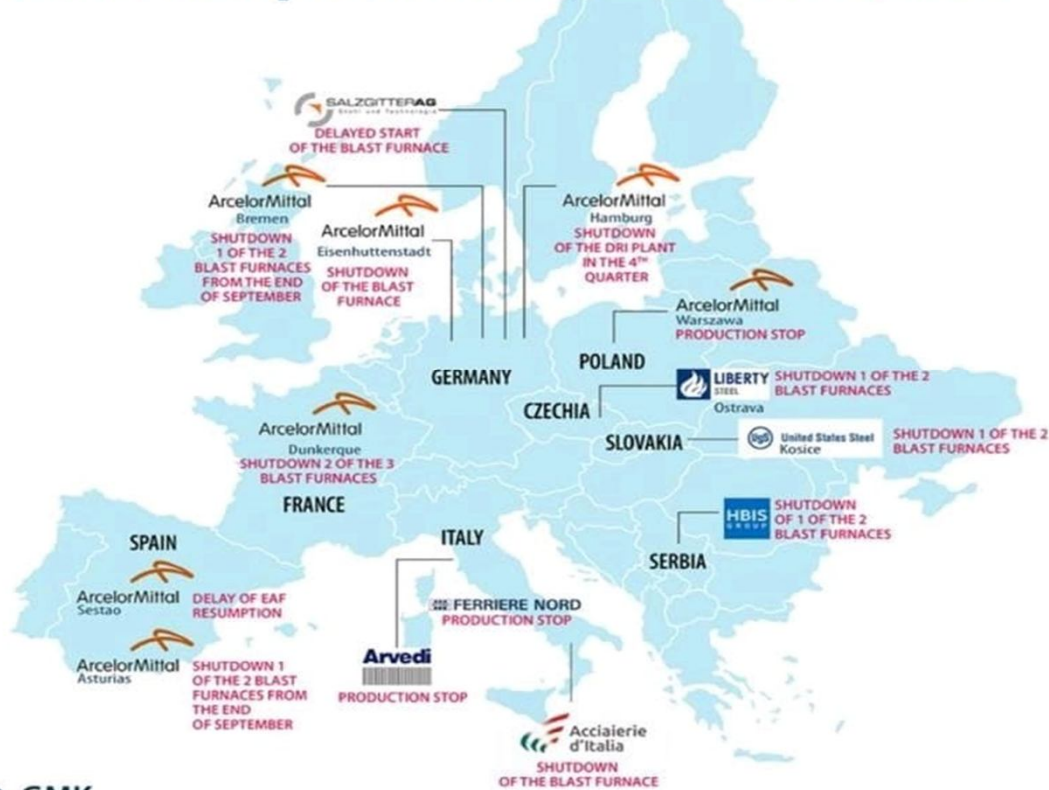


INTERNATIONAL MONETARY FUND

IMF.org #WEO

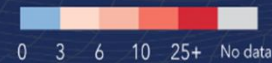
- 1) India fall under emerging market developing economy which is having highest growth prospect in world economy.
- 2) India is presently 5<sup>th</sup> Largest Economy in the world.
- 3) Market research shows India is set to become 4<sup>th</sup> Largest economy by 2027

## Idled steel plants in EU, as of 06.09.2022



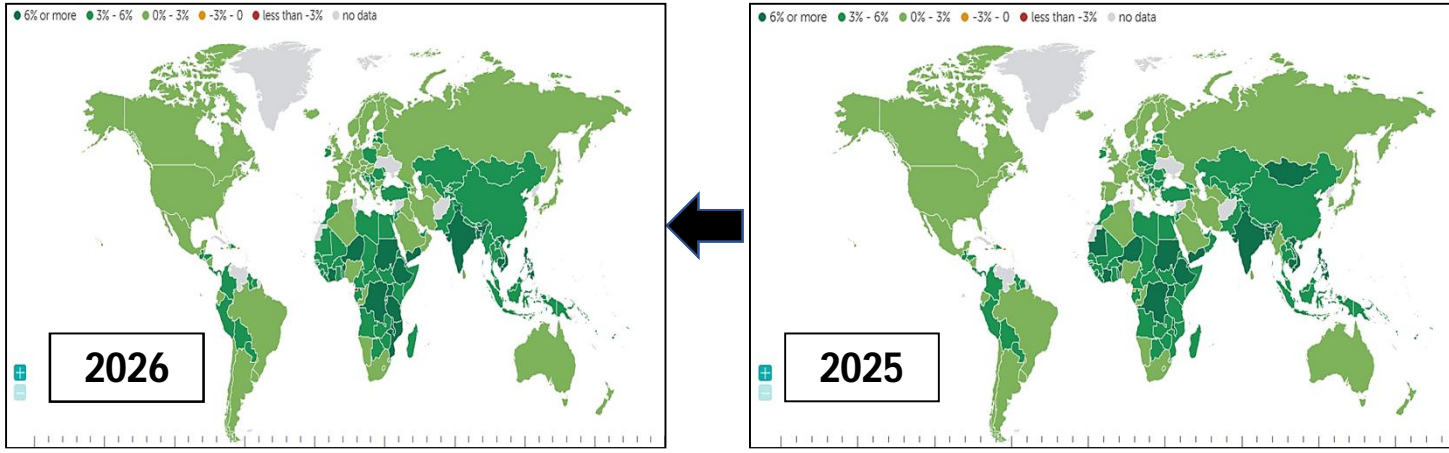
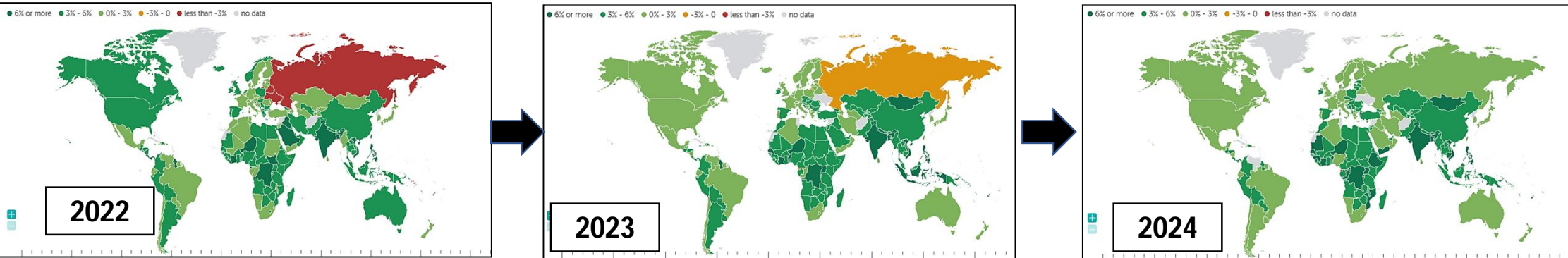
## Inflation Projections 2022

Average consumer prices, annual percent change



- The current geopolitical scenario resulting in interruption in the steel production at Europe.
- This is also leading to the upward revision in Inflation mainly for the “Emerging market and developing economies” and India is getting badly affected by this.

# Global Economy Scanning : Long Term GDP Transition



| Year | GDP India | Remarks  |
|------|-----------|--|
| 2022 | 7.6%      | 1. Lowering down of Russia – Ukraine war impact with time.   |
| 2023 | 6.9%      |  |
| 2024 | 7.0%      | 2. In Long term (5 years), the GDP of India will be hovering around 7% and for China it will be around 5%. |
| 2025 | 7.0%      |  |
| 2026 | 6.5%      |  |


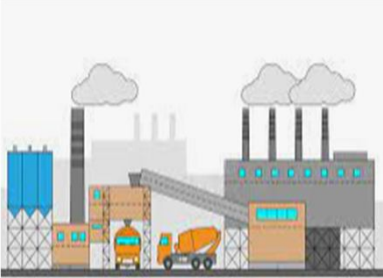



Source : IMF





***Refractory Demand Drivers & Growth Prospect***

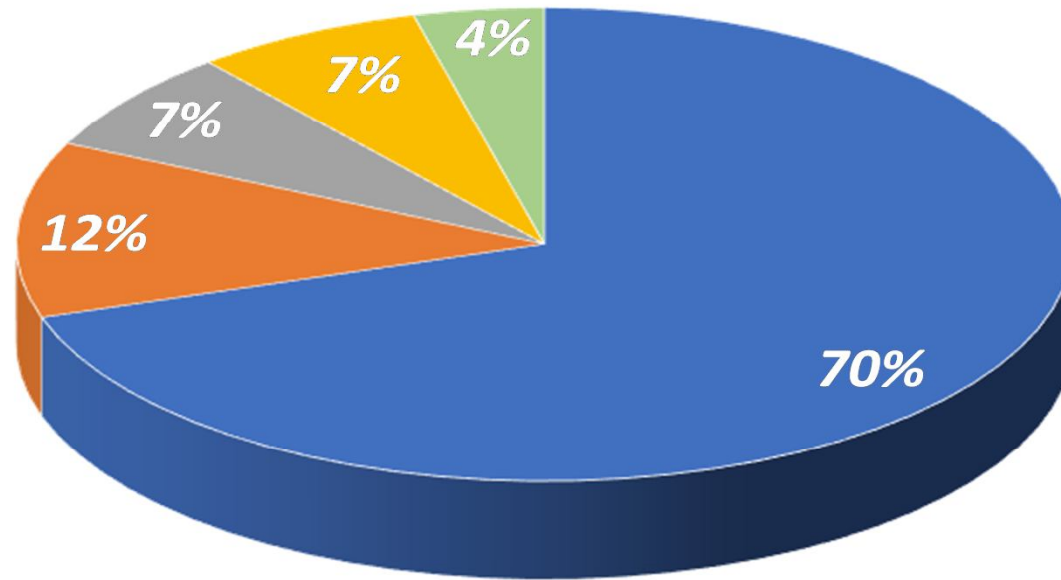
# Demand Drivers of Refractories

|  |   |  |   |   |
|--|---|--|---|---|
|  |  |  |  |  |
| <b>Steel<br/>Specific Consumption</b>  | <b>Cement<br/>Specific Consumption</b>  | <b>Copper<br/>Specific Consumption</b>   | <b>Aluminium<br/>Specific Consumption</b>   | <b>Glass<br/>Specific Consumption</b>   |
| <b>~10 - 15</b>  | <b>~0.9</b>   | <b>~3</b>  | <b>~6</b>   | <b>~4</b>   |

*Specific Consumption = Consumption of Refractories in Kg per Ton of Production*



## *User Industry Wise Refractories Usage*



■ **Steel** ■ **Cement** ■ **Non Ferrous** ■ **Glass** ■ **Others**

Source : TRLK Marketing Analysis

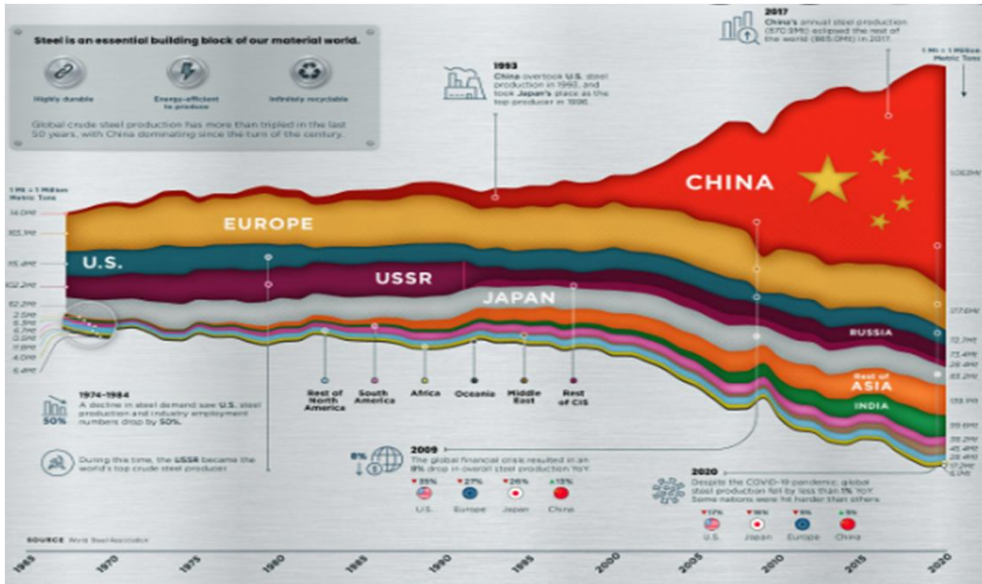
## World Steel in Figures 2022



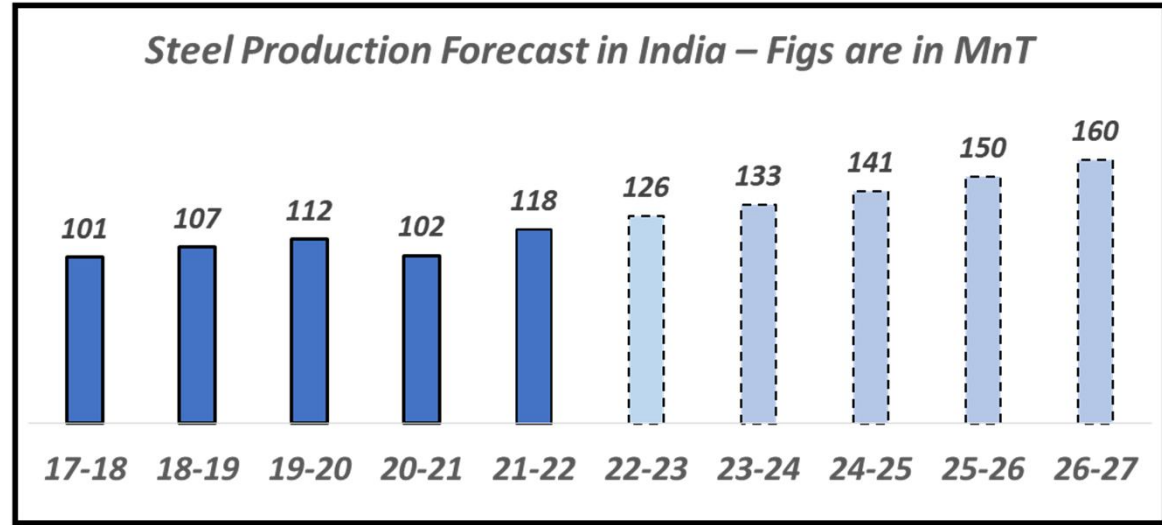
*Remarks :*

*Par-capita Steel Consumption of India imparts very high growth potential*

# Steel Industry : Growth Projection



Source : World Economic Forum



- In last two decades Global Steel production was mainly lead by China.
- In coming Five years, the CAGR of Indian Steel production expected to supersede Global Steel production.

## Airports



## Housing



## Capital Equipment

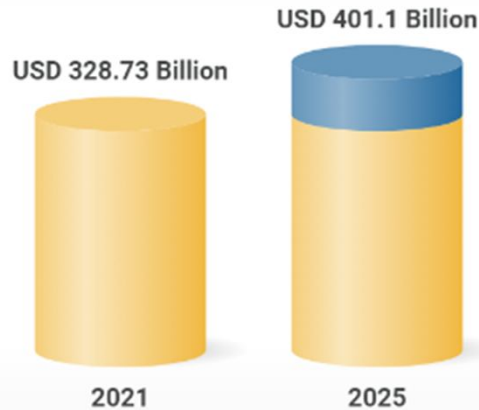


## Automobiles

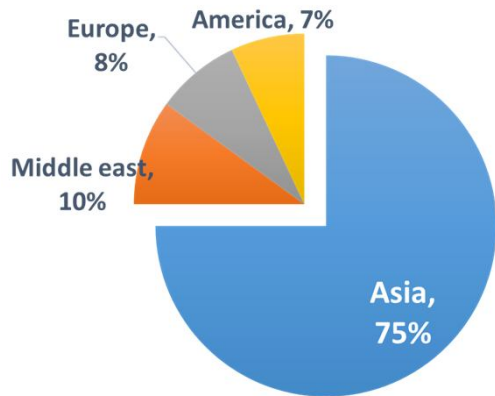


Source : TRLK Marketing Analysis

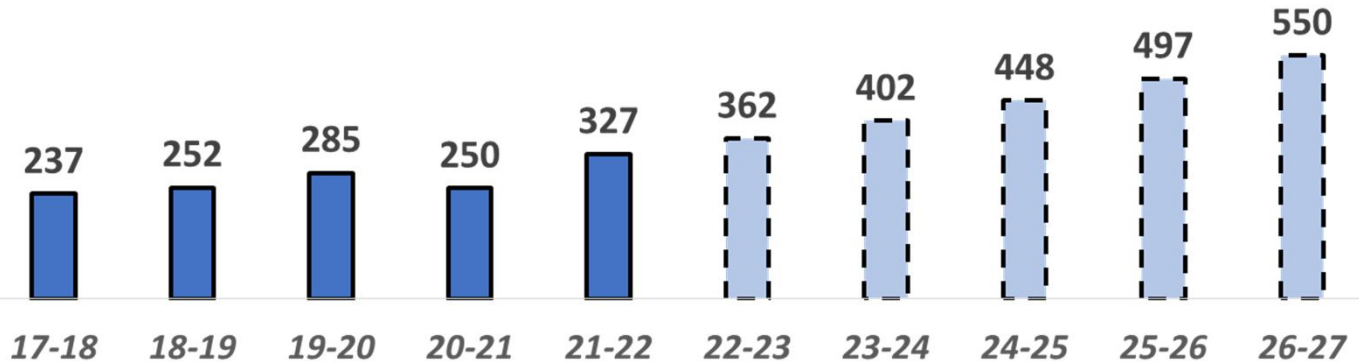
# Cement Industry : Growth Projection



Source : Research & Markets



Cement Clinker Production Forecast in India – Figs are in MnT

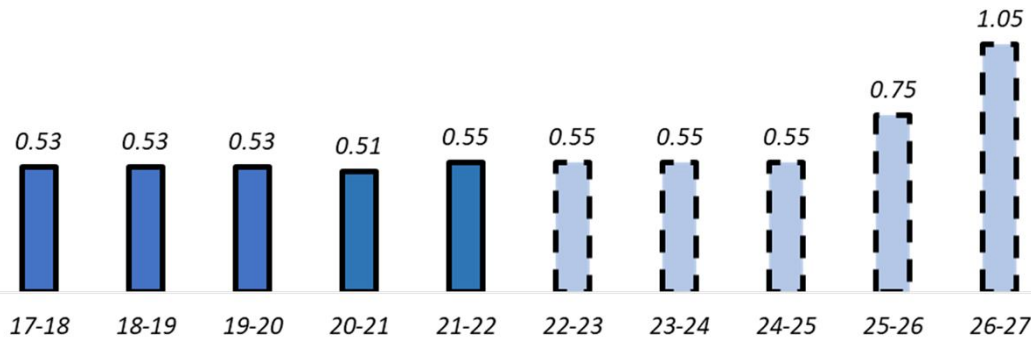


Source : TRLK Marketing Analysis

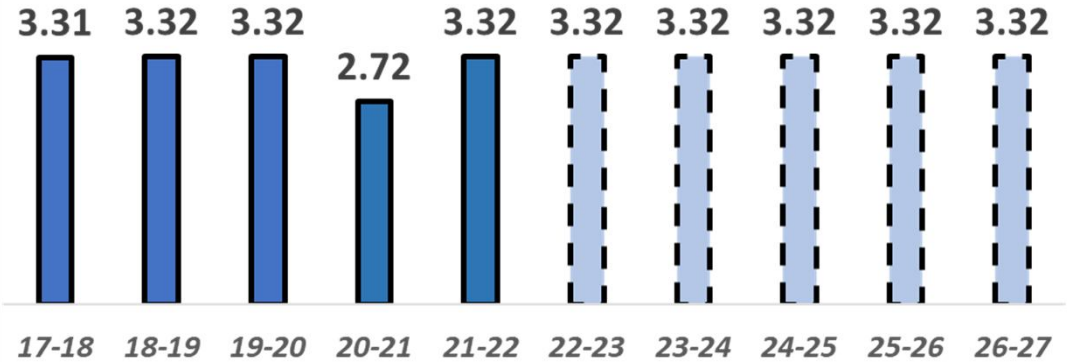
- **Asian region** to continue to lead cement production (75% ).
- **China & India** to dominate cement production on account of **demand** from large scale **Public infrastructure development** and meeting **Housing needs** for a large population.

# Copper : Growth Projection

Copper Production Forecast in India – Figs are in MnT



Aluminium Production Forecast in India – Figs are in MnT



- As per **Electric Vehicle forecasts**, copper demand from EVs to rise from 0.2 Million tonnes in 2017 to 1.91 Million tonnes in 2030.
- Aluminium production units are expected to maintain full capacity utilization.

## Electric Vehicles



Source : TRMK Marketing Analysis



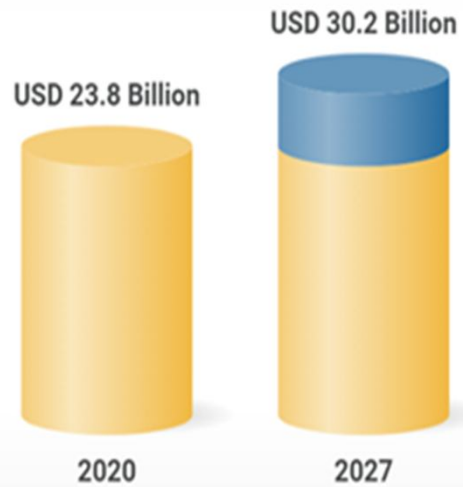
***Global Trend of Refractories***

## Global Market

## Indian Market

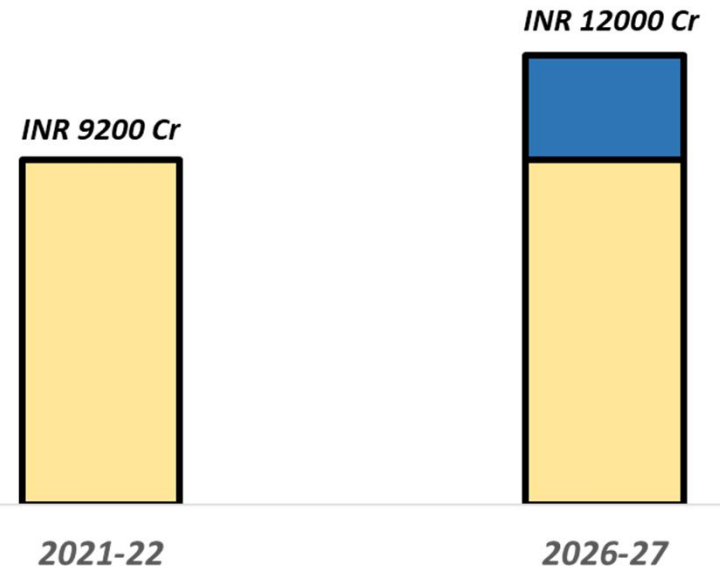
### Global Market for Refractories

Market forecast to grow at CAGR of 3.4%

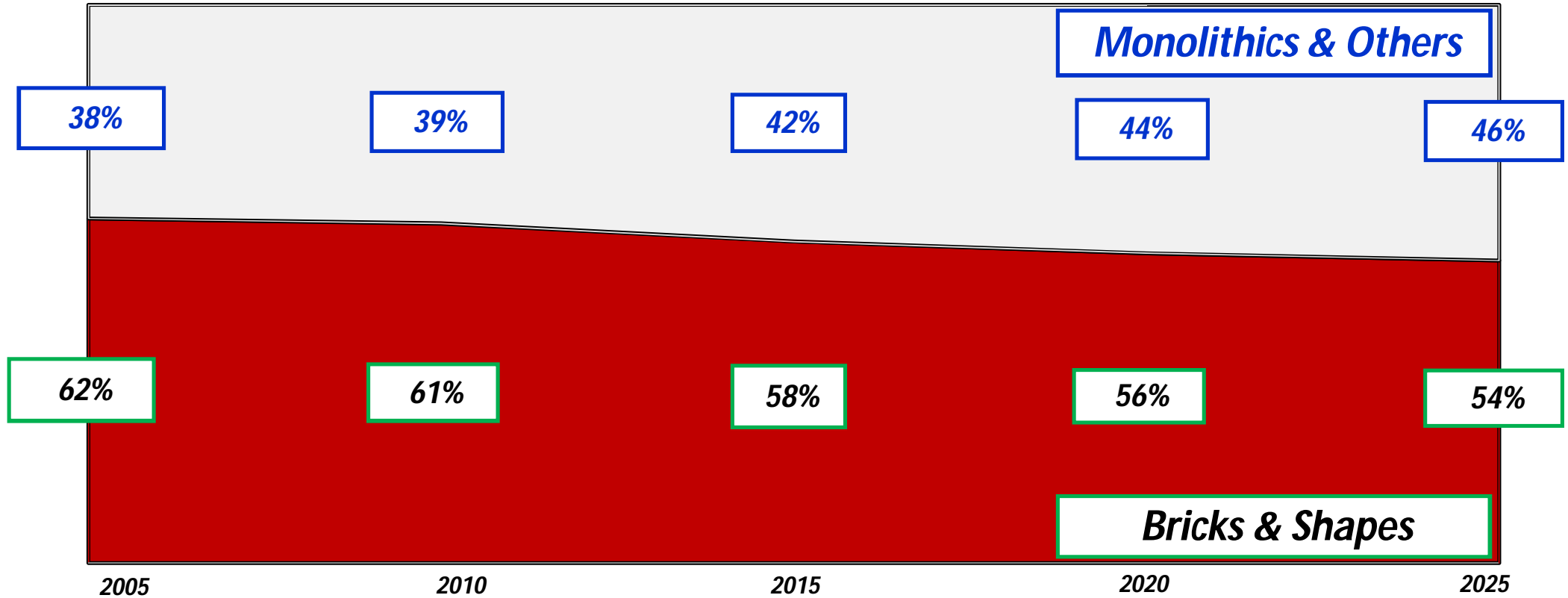


### Indian Refractories Market

Market forecast to grow at CAGR 5.5%



## World Refractory Consumption Distribution



- *In last three decades ~ 6% of the shaped refractories is being replaced by unshaped refractories.*



### Research and Trends

- **Consolidation of the Research Institutes & Establishments -**
- ✓ **FIRE (Federation for International Refractory and Education) : This Global Network of academic institutions and companies, in the field of refractories, has been incorporated as a non-profit organization in Canada, in May 2005. It is a network of professors, researchers and industrial partners, representing eight different universities spread in six different nations and eleven multinational companies. The main objectives are research in the field of Refractories and train highly-qualified personnel for the industry.**
- ✓ **ATHOR ( Advance Thermo-machinal Multiscale Modelling of Refractory Lining) : A part of European training Network, incorporated in October 2017. This is an innovative, collaborative and interdisciplinary project that brings together 6 academic beneficiaries and 8 private partners. The main objective is to develop high-end engineering technologies in material engineering and numerical simulations for refractories products and end users.**

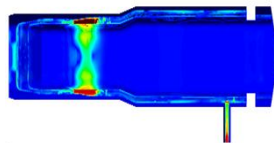


## Research and Trends

- **Focus on Core Research activities on refractories & advance materials science like high-resolution imaging of microstructures, Crystal Chemistry, Surface Treatment (plasma, flame, laser) etc.**

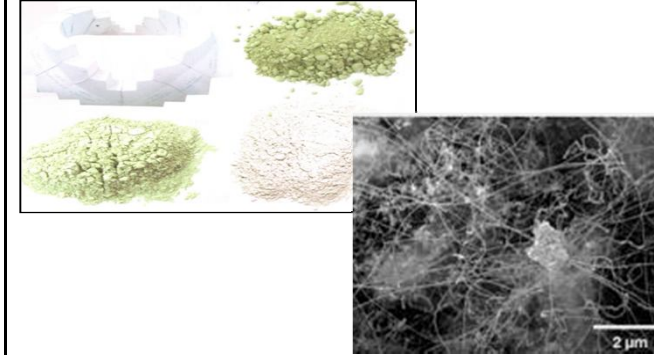


- **3D Modeling of design**
- **Computational Fluid Dynamics Modeling (CFD)**
- **Simulation studies on refractories behaviors on application areas**

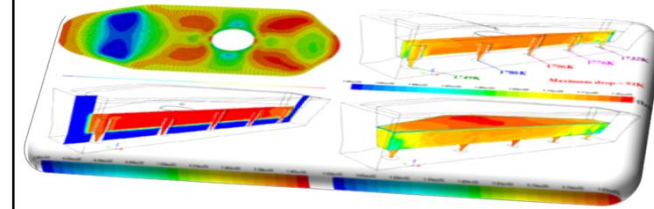


## Research and Trends

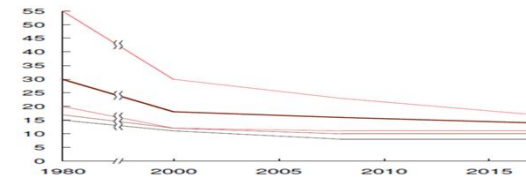
- **New Concepts & Products development -**
  - ✓ **Unshaped Mag-C refractories**
  - ✓ **Unshaped Silica refractories**
  - ✓ **Development of low carbon refractories through incorporation of nano-materials**



- **Online health check-up of refractories and prediction of life through mathematical modeling.**
- **Thermal profile calculations**



- **Reduction in Specific consumption of Refractories**



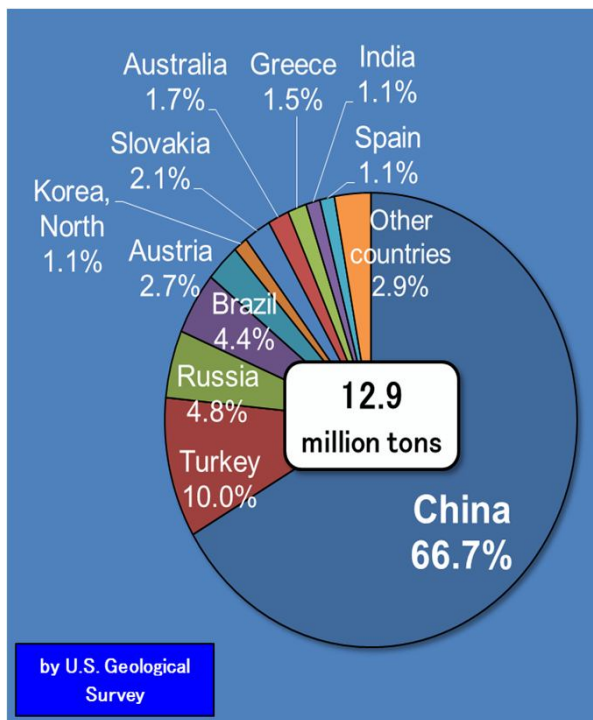


***Key Challenges for Refractories Industries***

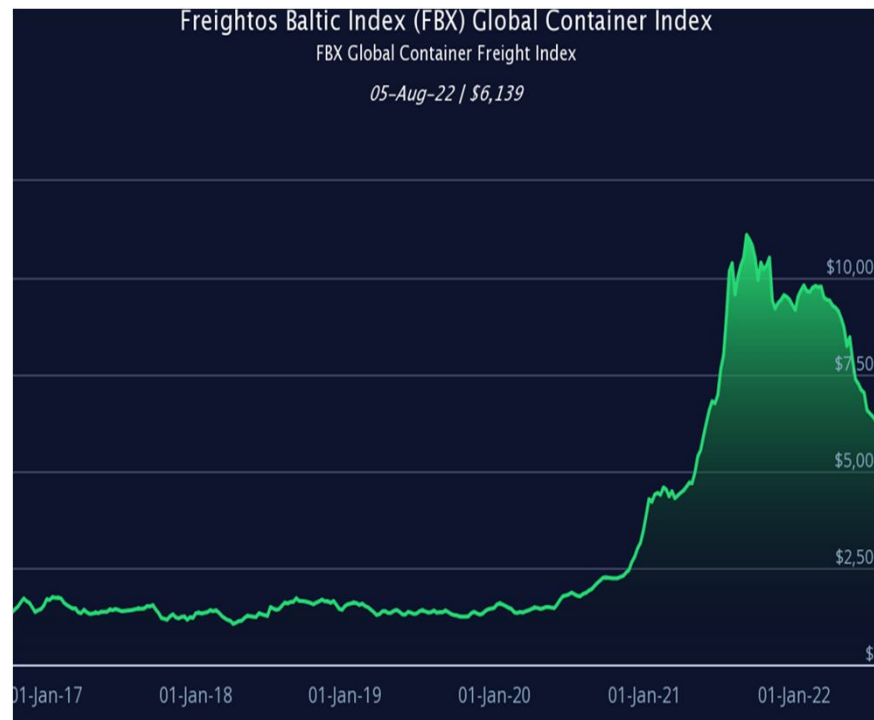
# Key Challenges for Refractories Industries

(1)

## Raw Materials Supply Chain Management



World MgO Production



Movement of Ocean Freight Cost – Baltic Index

- Dependency on Specific countries for high end and critical raw materials.
- Challenges in Technology of raw materials beneficiation and recycling.
- Turmoil in global logistic system.

## Key Challenges for Refractories Industries

(2)

### Service & Safety



- *More focus on safety of manpower and machineries.*
- *Reliability on product performance and innovative solutions.*
- *More need of advance service elements for online health checkup of the equipments and prediction of the performance.*
- *Reduce the refractories maintenance downtime and increase the equipment availability time.*

(3)

## Trust & Commitment



- *Focus on Trustworthy suppliers and long-term commitment on uninterrupted supply change management.*
- *Preference to the suppliers having backward integration for raw material sources.*
- *Focus on usage of alternate and recycle raw materials for green environment & cost-effective products without affecting the performance*

## Key Challenges for Refractories Industries

(4)

### Make in India

**KROSAKI**  
KROSAKI GROUP

**TRL KROSAKI**

Proud to be a part of  
**Atmanirbhar Bharat Abhiyan**  
Customised Innovation With  
Uncompromised Safety

**New Generation High  
Performance Refractories from  
The Soil of India**

**TRL KROSAKI REFRACTORIES LIMITED**  
www.trlkrosaki.com

QR Code

The advertisement features a large, glowing map of India in the background. In the foreground, a worker in a blue uniform and white hard hat is looking at a tablet. Two small inset images show industrial refractory products. A QR code is located in the bottom right corner.

- *Technological improvement and production capacity enhancement to meet the growing refractories demand from user Industries.*
- *Offer complete range of refractories products from India with a regular and consistent supply chain management.*
- *Sourcing of raw materials to avoid any disturbance in production*



## Key Challenges for Refractories Industries

(5)

### Energy Crisis



- *Limited resources of conventional energy sources.*
- *Crisis already encountered in some of the continents due to scarcity of resources and geopolitical disturbance.*
- *Focus on the conversion to Natural Gas firing*



***Preparedness of Refractories Industries***

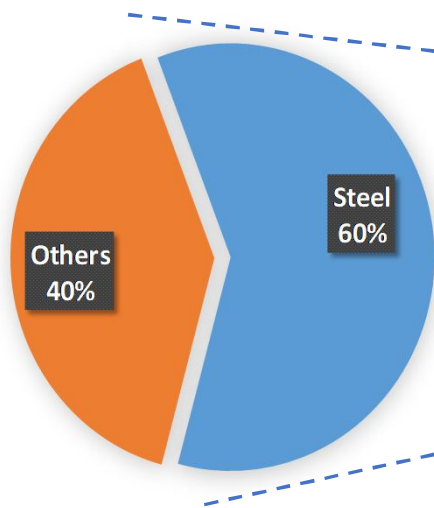
## 1. Technological advancement and Production capacity enhancement



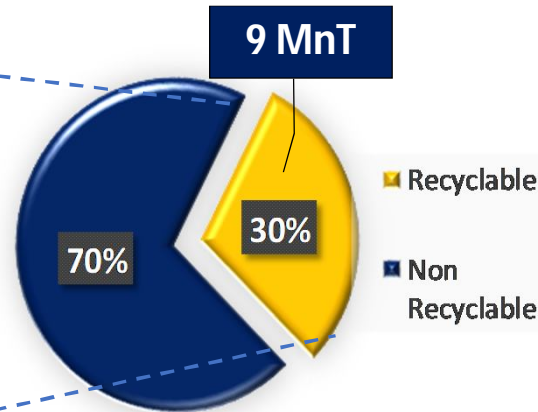
- **Enhance the production capacities with World's best Technologies**
- **Upgradation of production facilities to meet the challenging performance requirements.**

## 2. Sourcing and securing of raw materials

Industry wise use of Refractories



Recyclable Refractories



- *Reduce the dependency of raw materials from any single country*
- *Focus on recycling, reuse and beneficiation of raw materials*

*Recent Research work estimated that almost 30% of total used Refractories from Steel Plant is Recyclable*

## 3. Digitalization and Smart Refractories Solutions



- ***Moving towards Industry 4.0***
- ***Automation & Mechanization in both Manufacturing & Application of Refractories.***
- ***Customer Relationship Management in Digital Platform***

## 4. Sustainability



- ***Focus on sustainability***
- ***Reduction of Carbon footprint and move towards Green refractories solutions***
- ***Focus on Gas Firing***

***THANK YOU***