

# N C Mathur



<b>Present Affiliation</b>	President Indian Stainless Steel Development Association (ISSDA)
<b>Academic Qualification</b>	B. Tech (Hons.), Birla Institute of Technology and Science (BITS), Pilani
<b>Area of Specialization</b>	Worked in India with leading Industrial Houses for over 46 years and has been associated with Stainless Steel Industry for last 36 years in various capacities
<b>Achievements / Awards</b>	- “Stainless Steel <b>UDYOG RATNA AWARD</b> ” in September, 2009
<b>Paper</b>	<b>Present Status of Stainless Steel Industry in India &amp; it's Future Prospects</b> <i>N. C. Mathur, Rohit Kumar</i>

# Stainless Steel Centenary Symposium

## SSCS 2013

August 12 – 14, 2013

@

Victor Menezes Convention Center  
Indian Institute of Technology Bombay  
Powai  
Mumbai- 400 076



*Organized by:*



*Indian Institute of Metals  
Mumbai Chapter*



*Department of Atomic  
Energy*

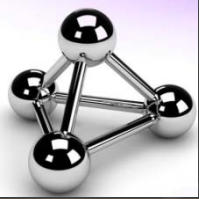
*In association with:*



## Present Status of Stainless Steel Industry in India and it's Future Prospects

Presented by :  
N.C. Mathur

President : Indian Stainless Steel Development Association (ISSDA)



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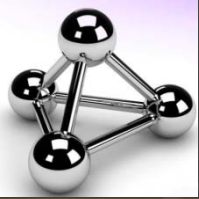
**Stainless Steel Scenario**

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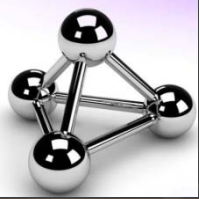
**Watch For**

**Summing Up**



# Centenary of Stainless Steel





# Centenary of Stainless Steel

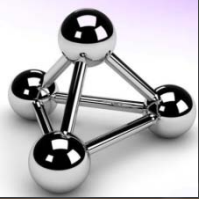


**International Stainless Steel Forum (ISSF) launches 100 Years of Stainless Steel website to celebrate a “Century of Innovation”**

**The Global Stainless Steel Industry community has completed a Century since Stainless Steels were first created, patented and launched.**

**To celebrate the anniversaries, International Stainless Steel Forum (ISSF) has launched a new *Website : [www.stainlesssteelcentenary.info](http://www.stainlesssteelcentenary.info)***

**This website is dedicated to the history of Stainless Steel and its Innovative applications.**



# Evolution of Stainless Steel



**Nickel**  
1751



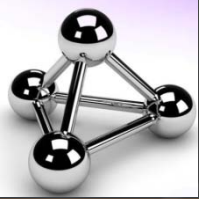
**Molybdenum**  
1778



**Chrome**  
1797



**Stainless Steel**  
1912



# 100 Years of Stainless Steel



**1912**

After four years of development work in Krupp's laboratories, the physicist Professor Benno Strauss and his co-worker Dr. Eduard Maurer found the formula for non-rusting steels which are insensitive to water and humidity

**1913**

English metallurgist Harry Brearley invents Stainless Steel in his search for an alloy to protect cannon bores from erosion.

**1915**



During World War-I, Stainless Steel is used to manufacture valves for aircraft engines

**1919**



1919-1923, Sheffield cutlery start regular production of Stainless Steel cutlery, surgical scalpels and tools

**1924**



The first Stainless Steel roof makes an appearance in America

**1929**



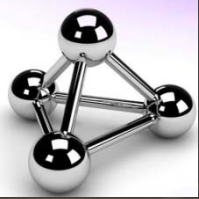
The first Stainless Steel Tanker is used for transporting 3,000 gallons of milk.

**1930**

1928-1930, the top seven arches of Chrysler Building are clad in Stainless Steel. This New York City landmark is one of the world's most recognized skyscrapers.

This iconic building inspired new age architects to explore the potential of Stainless Steel in Architecture, Building and Construction worldwide.





# 100 Years of Stainless Steel

In the year 1990, Jindal Stainless became the pioneer in developing and commercialize 200 Series (Chrome-Manganese) Stainless Steel in India.

100  
YEARS  
OF  
STAINLESS  
STEEL



1931

Duplex Grade Stainless Steel is first produced in Sweden.



The first Stainless Steel railway carriage appears in the US. Also, Rolls Royce produces the first Stainless Steel radiator grill and emblem.

1933



Stainless Steel Kitchen Sinks and furniture are introduced.



1950



Stainless Steel is used with increasing frequency in the automobile industry.

1963

The first Stainless Steel Razor Blades are produced.



1969

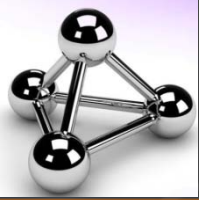


The first men on the moon (Apollo 11) are taken there by a Stainless Steel Saturn V Rocket.

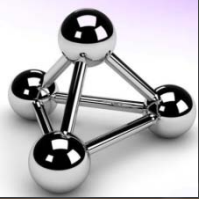
2000...

Stainless Steel is used in the façade of the world's tallest building, the Burj Khalifa in Dubai, which was opened in 2010.



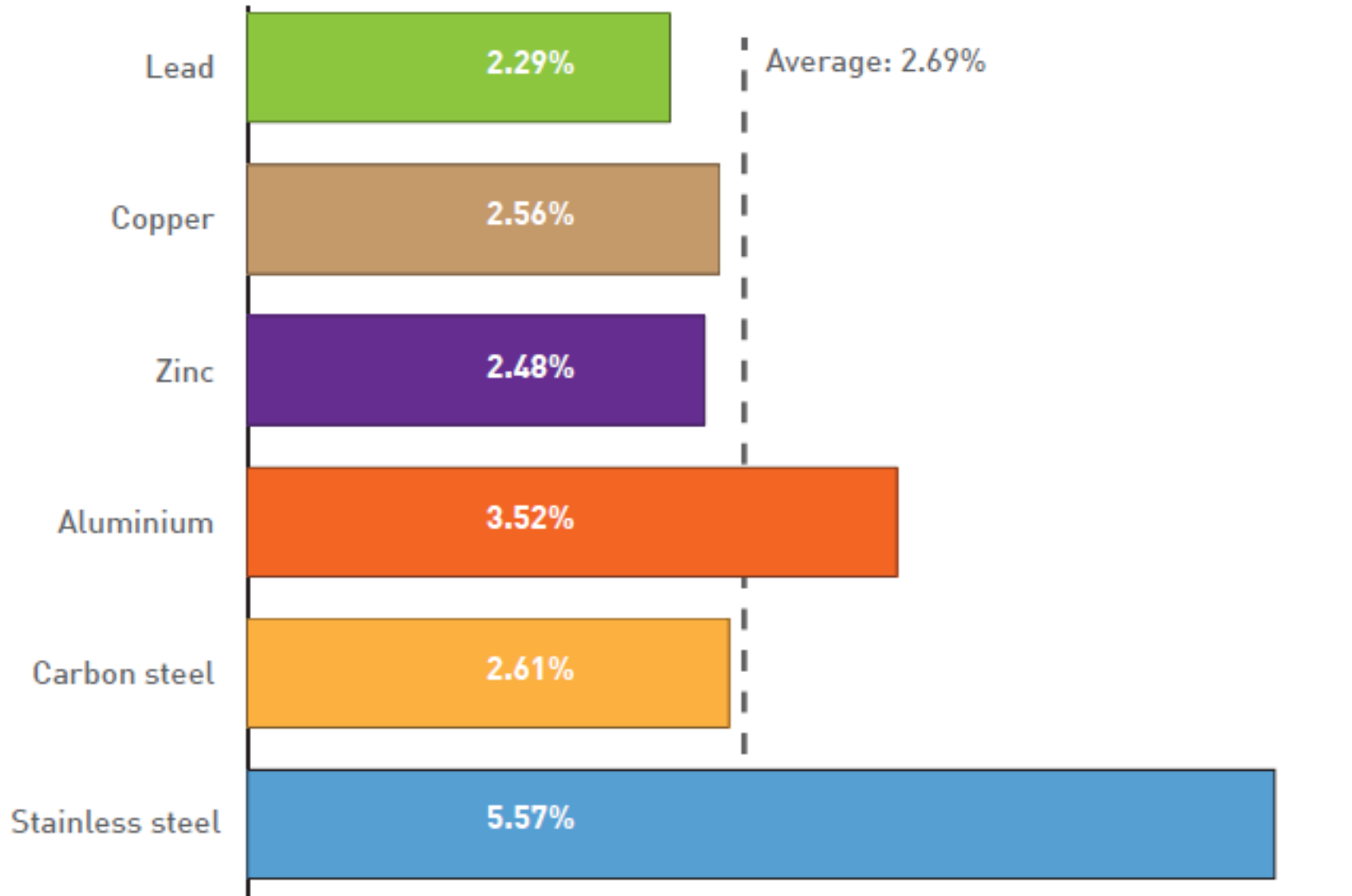


# Global Stainless Steel Scenario

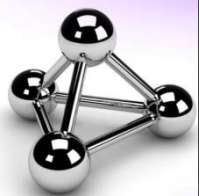


# Stainless Steel .... a Growth Material

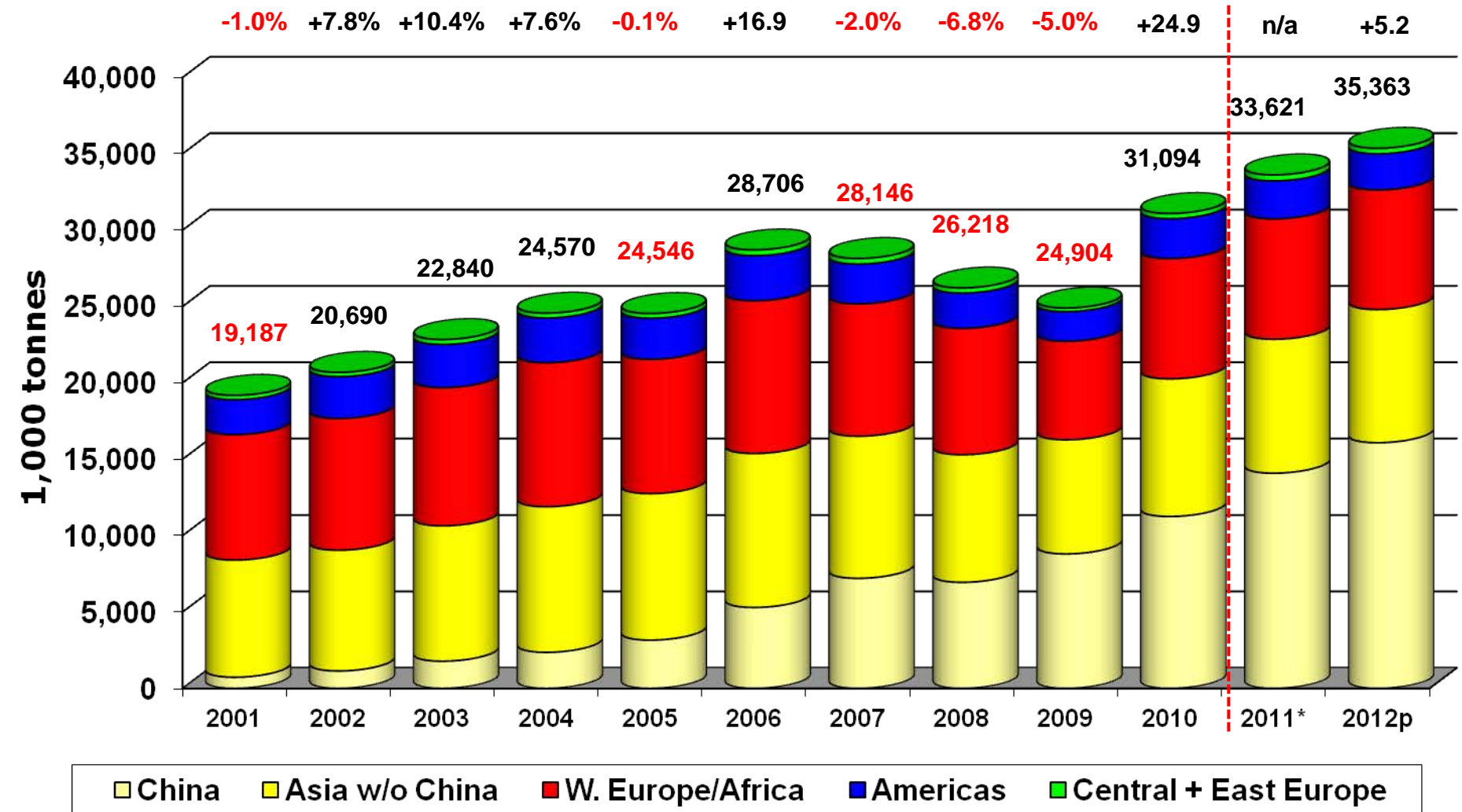
***Compound Annual Growth Rate of major metals (%/year): 1980 - 2012***



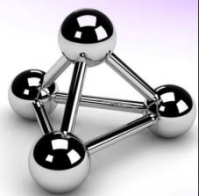
Source: ISSF



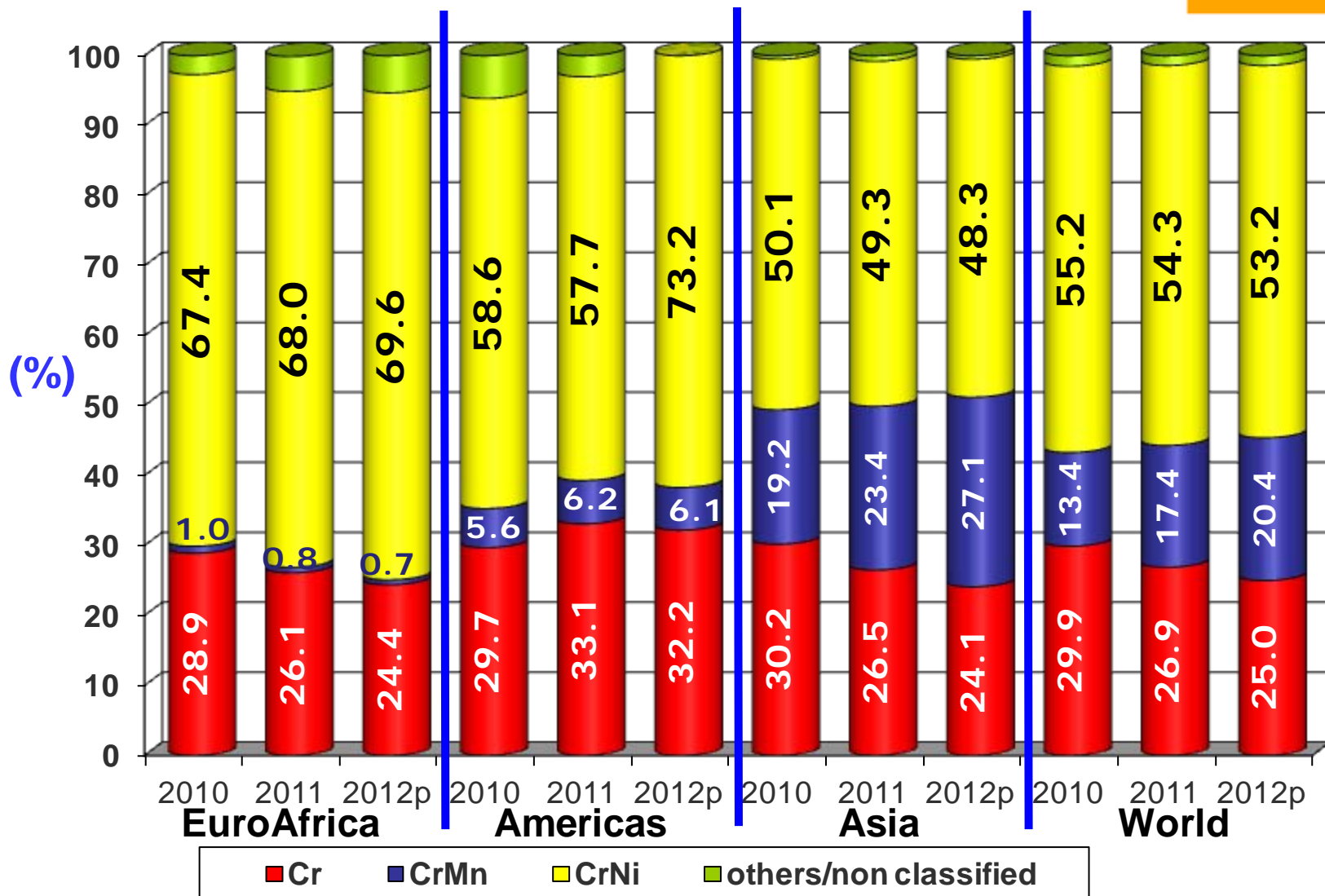
# Stainless Steel Crude Production



\* Major correction of Chinese figure for 2011, therefore not comparable with previous years

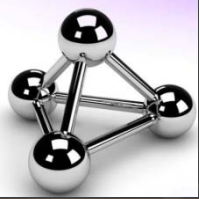


# Stainless Crude Steel Production (By Categories)

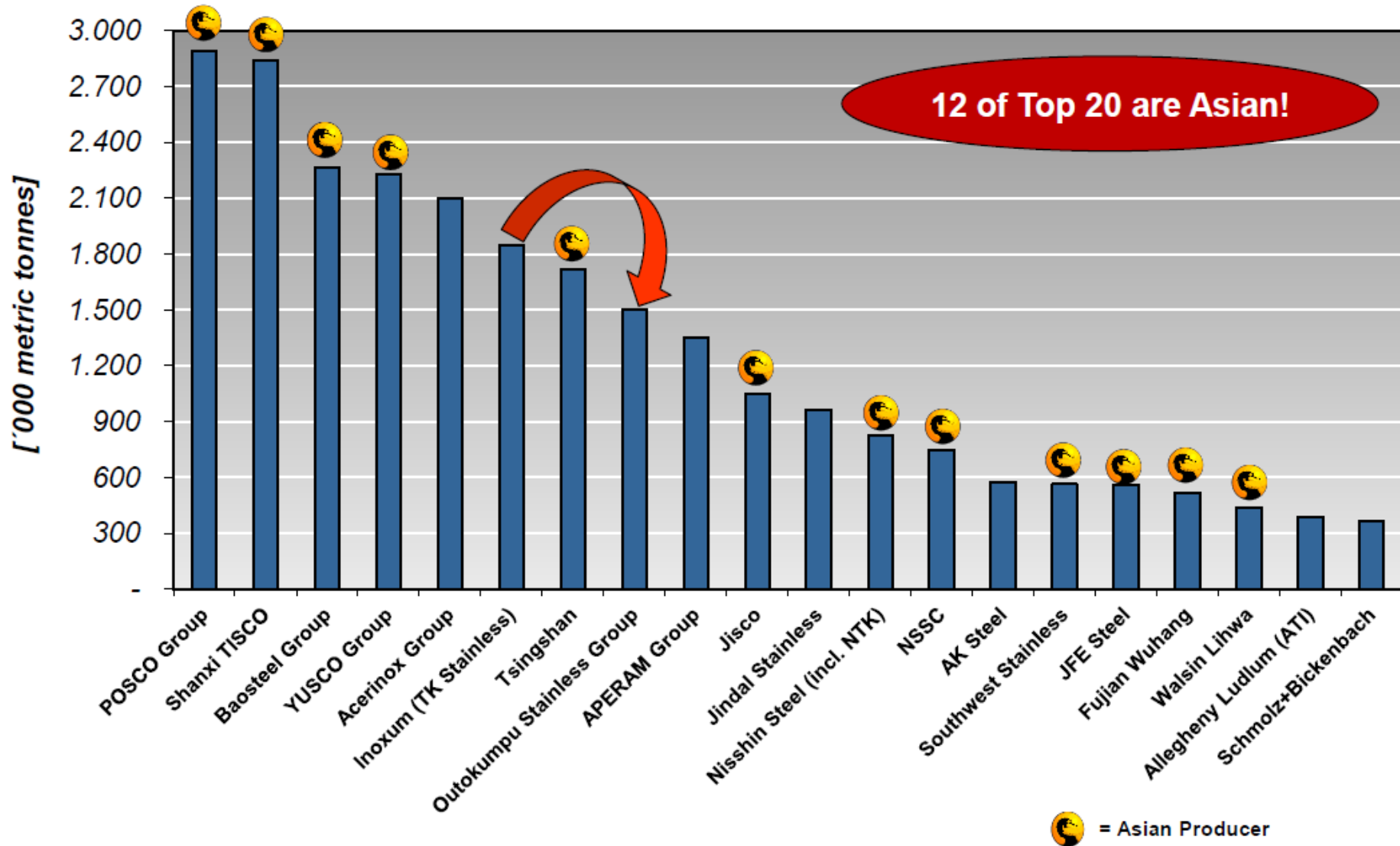


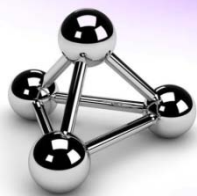
Note: Due to major corrections of Chinese figures since 2011 not fully comparable with 2010, for CrMn steels in particular

Source: ISSF

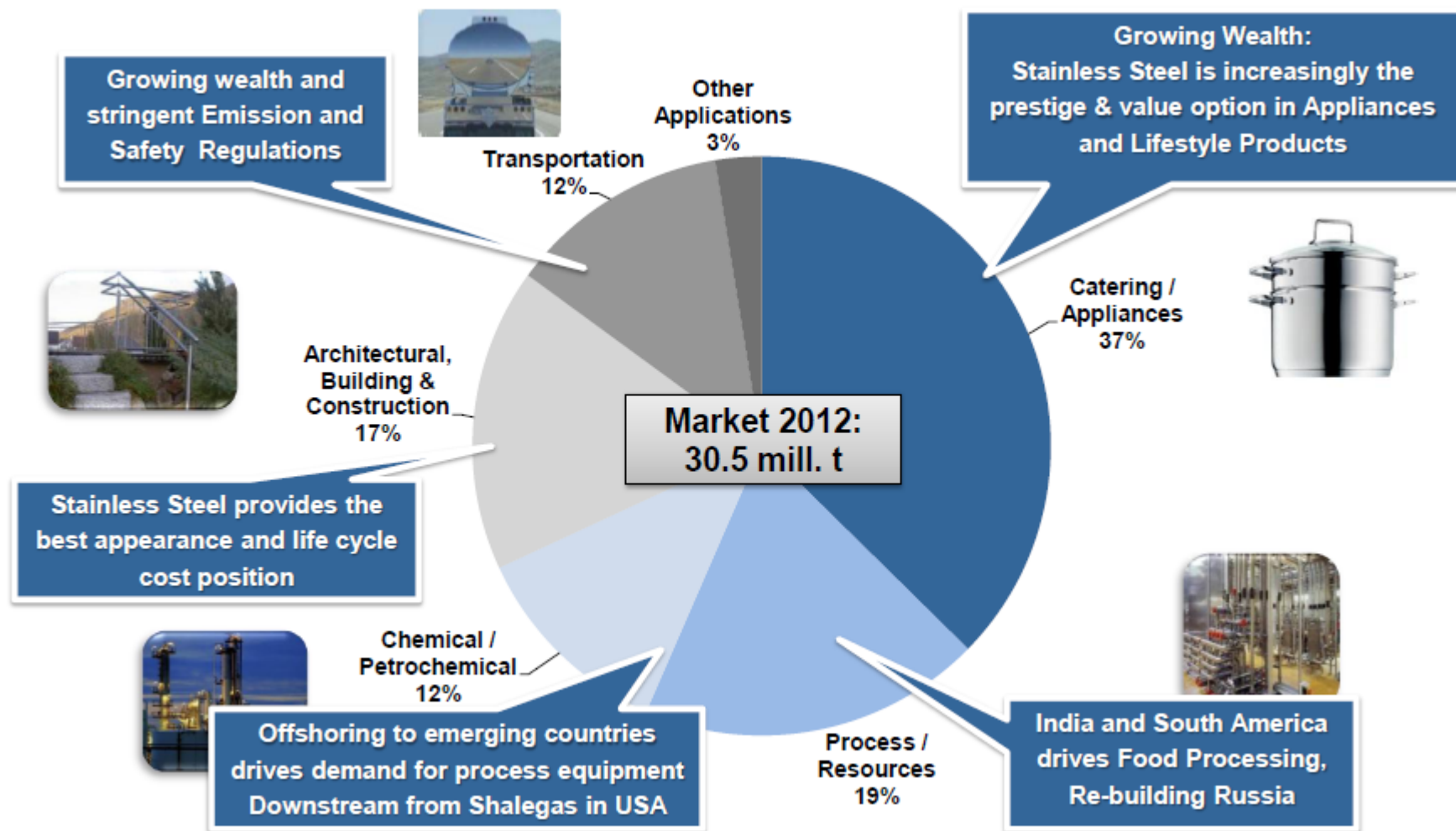


# 'Top 20' Stainless Steel Producers (2012 e)



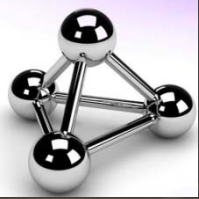


# Global Stainless Steel Market Drivers by End Use Segments

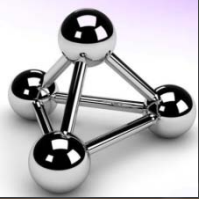


**Global long term outlook remains bright**

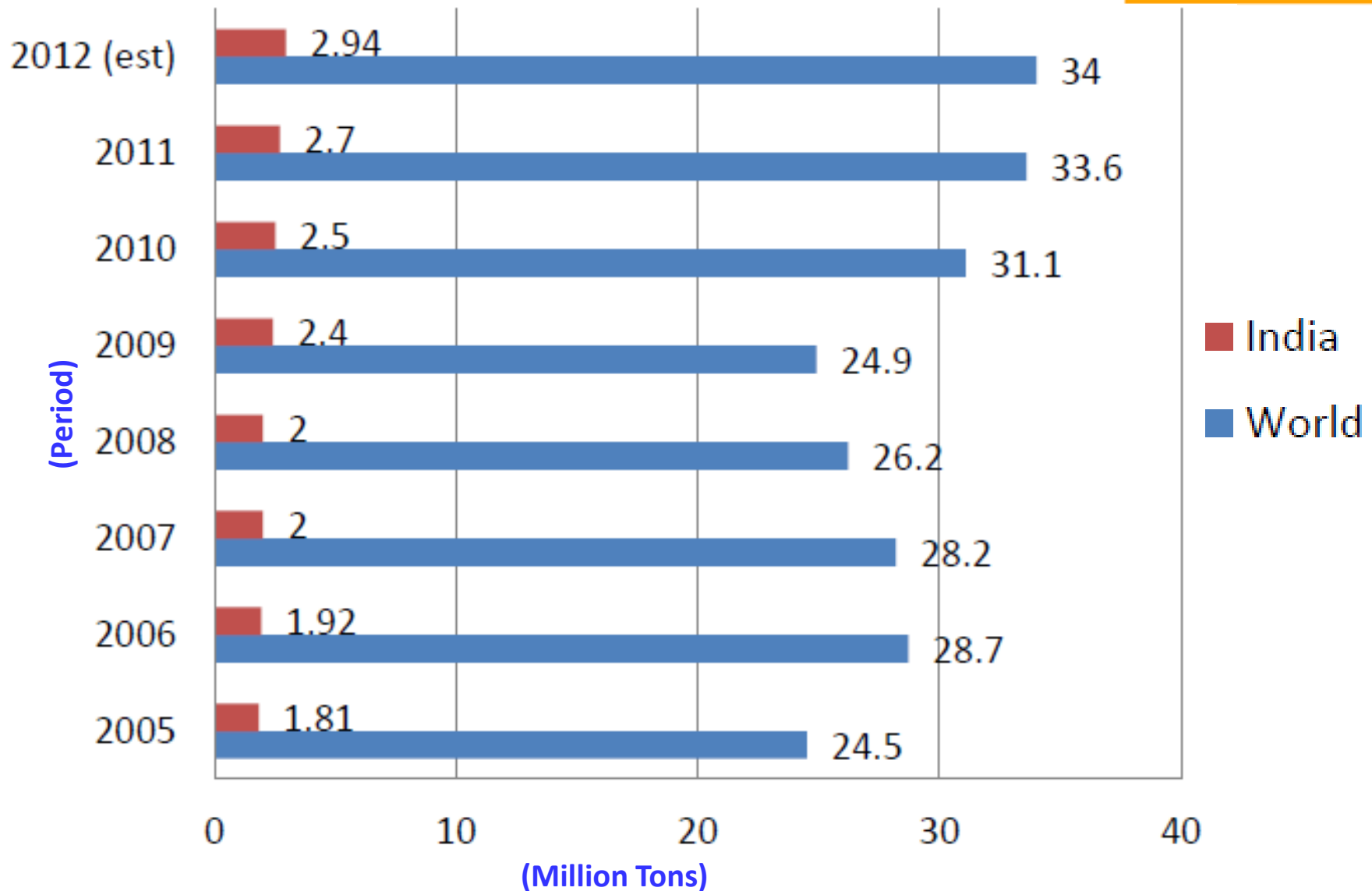


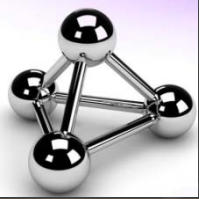


# Indian Stainless Steel Scenario

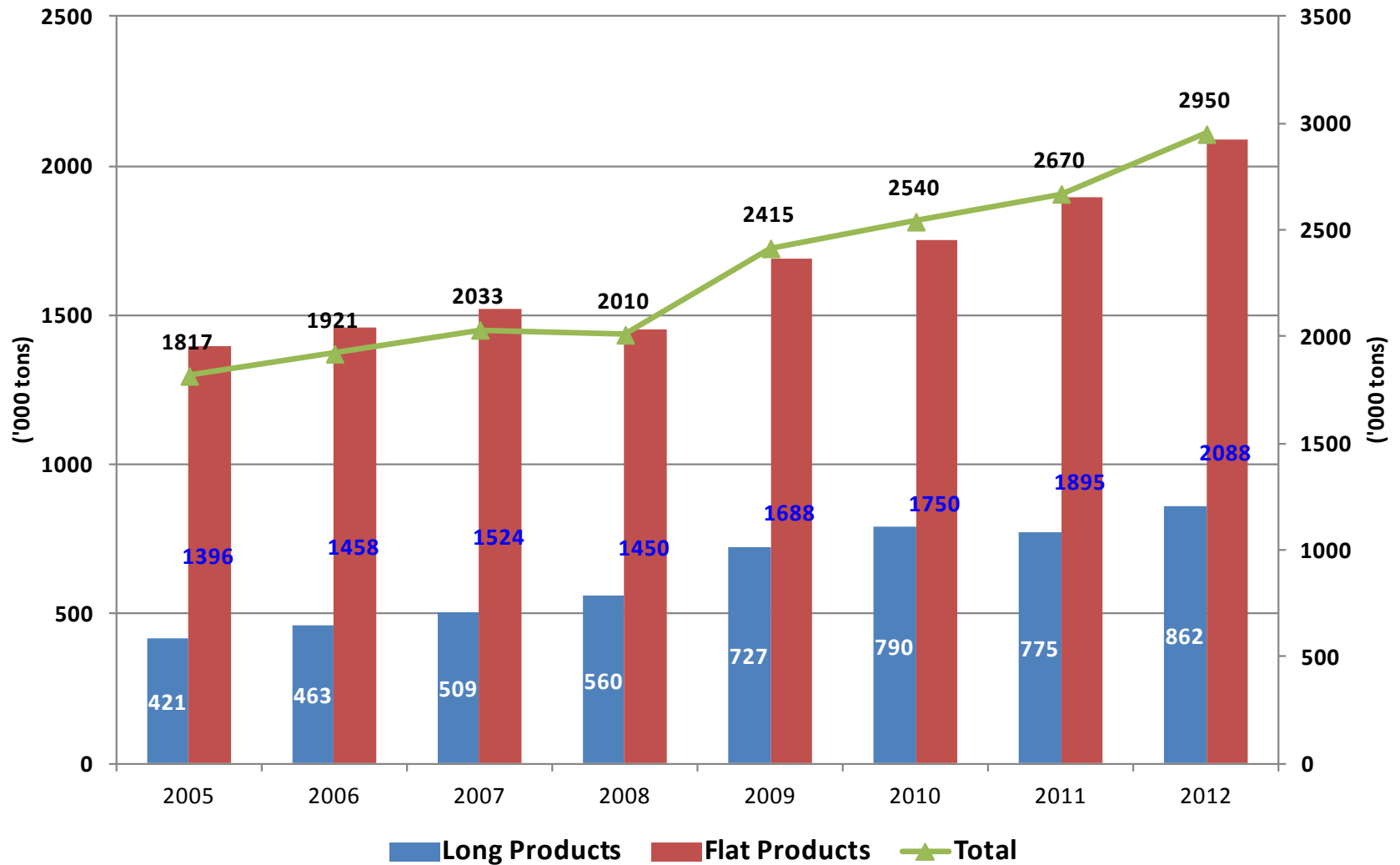


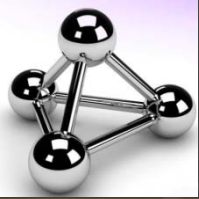
# Crude Stainless Steel Production World Vs. Share of India





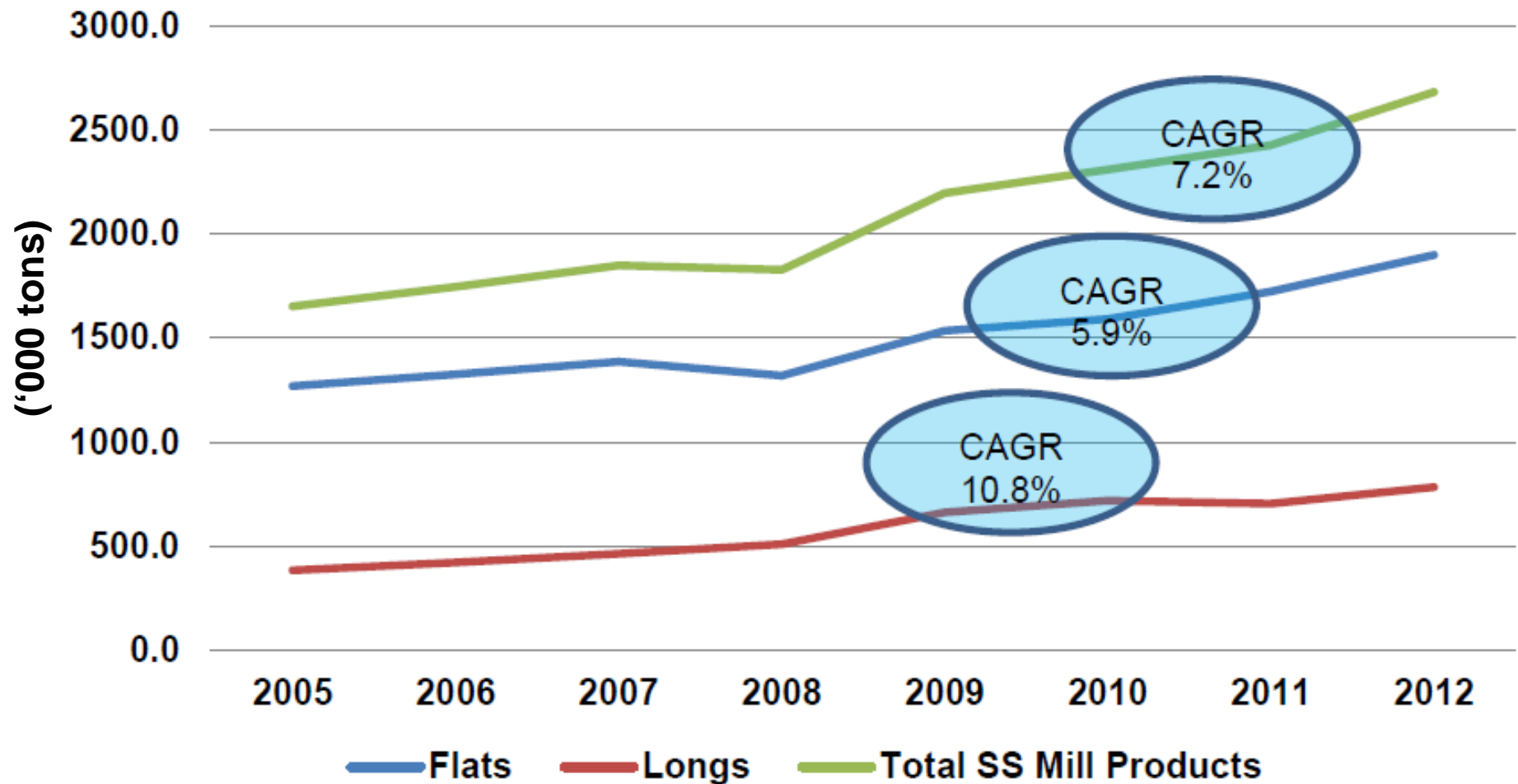
# Stainless Steel Melt Production : India

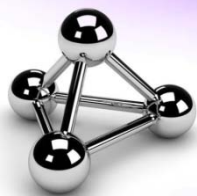




# Stainless Steel Mill Products

## Production Trends : India



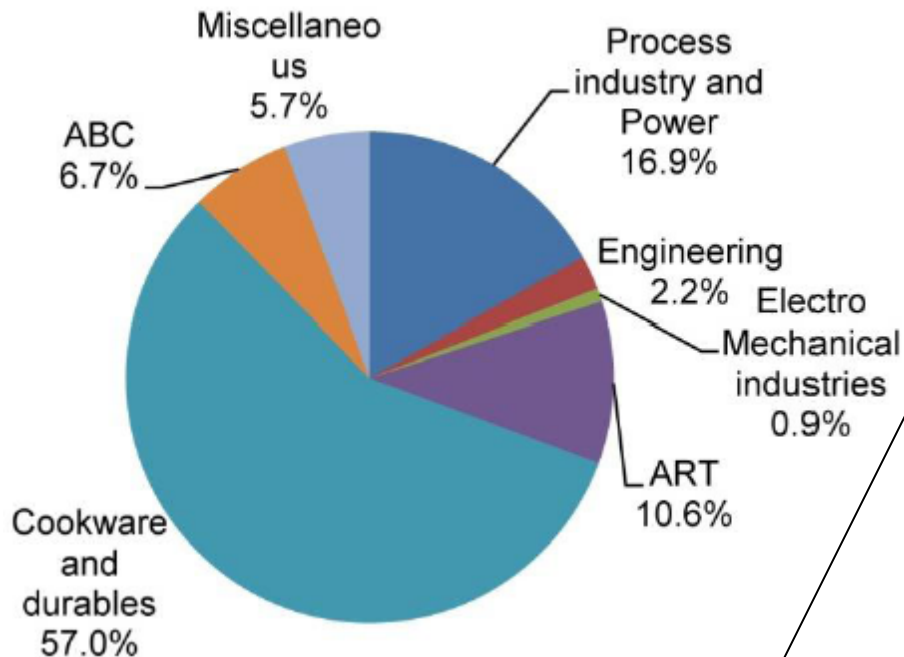


# Stainless Steel Consumption by End Use

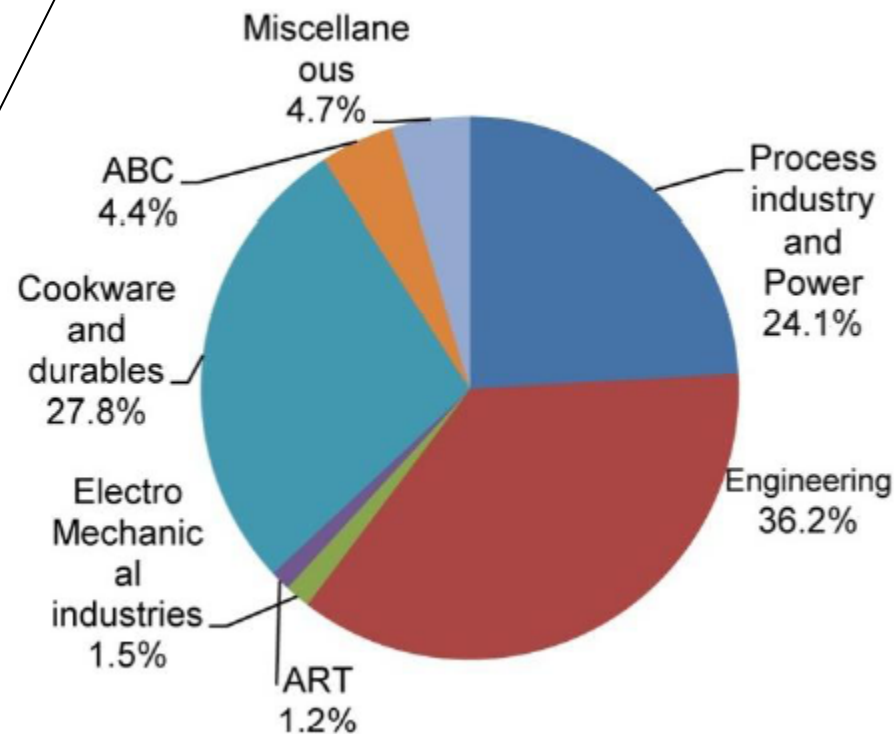
## India

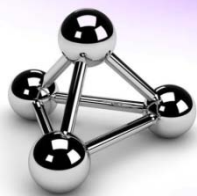


### Flat Products : Year 2012

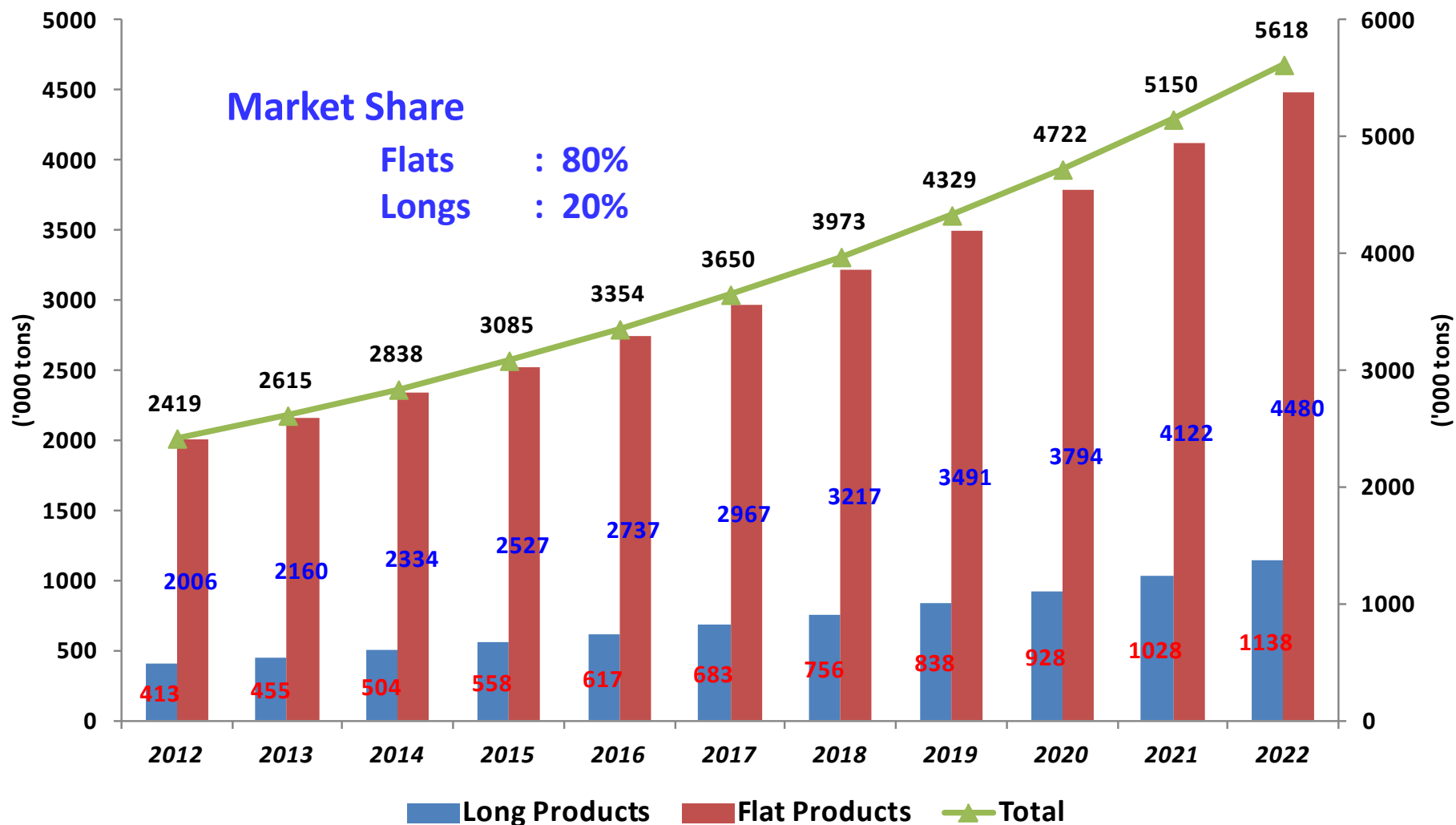


### Long Products : Year 2012

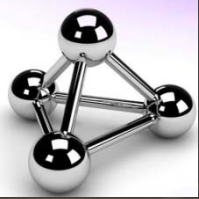




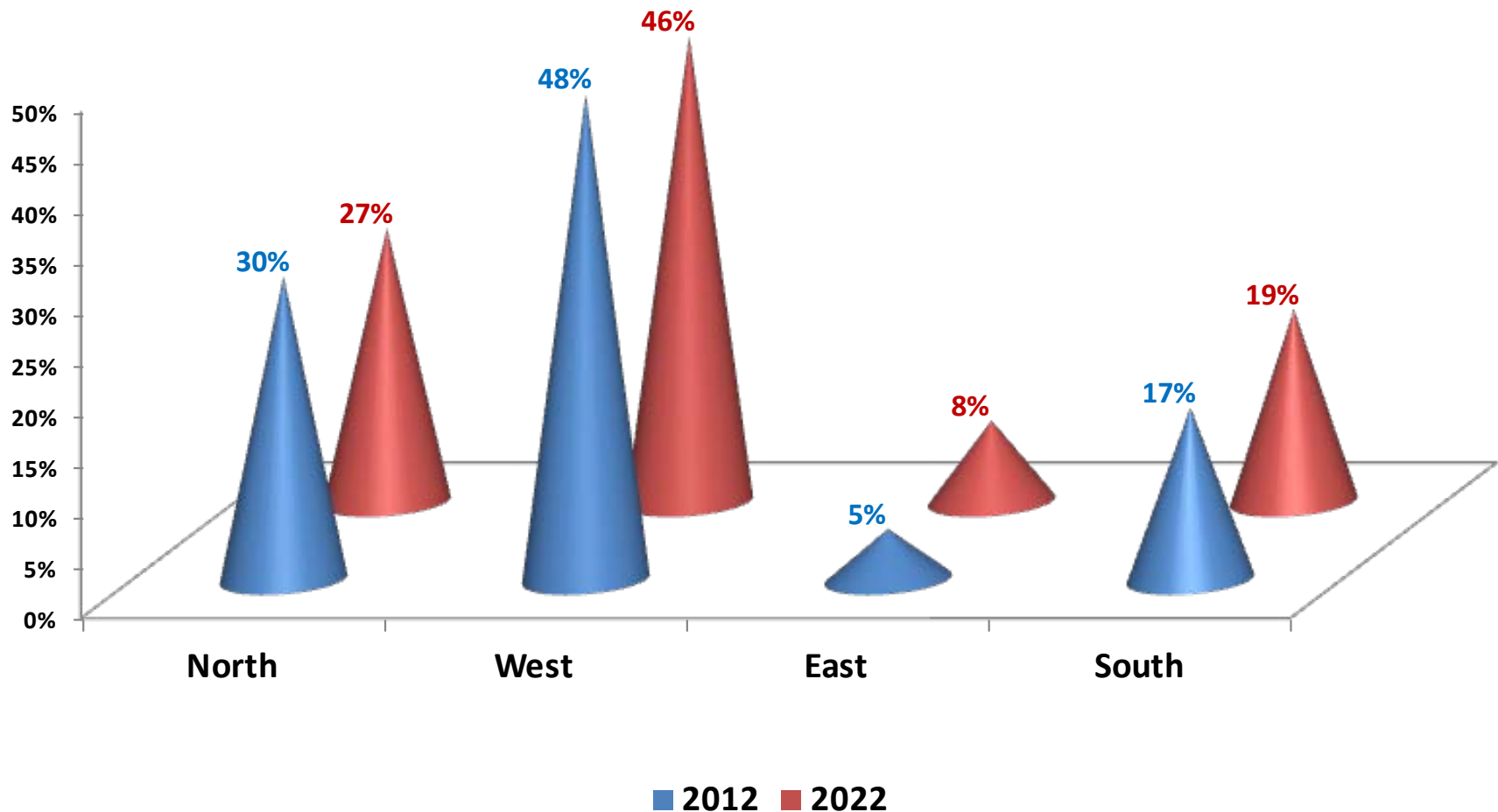
# Projected Apparent Consumption of Stainless Steel in India

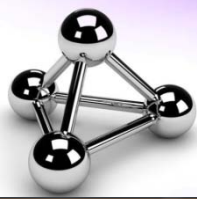






# Projected Regional Stainless Steel Consumption in India

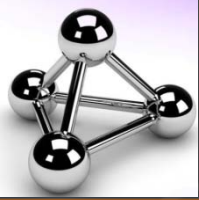




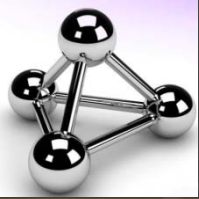
# Opportunities in Indian Infrastructure Structure



- India plans to spend US\$1 Trillion on infrastructure in next five years.
- Indian airports require investments worth US\$13 billion in next five years; private sector to contribute US\$10 billion.
- Highways sector will attract investments worth US\$123 billion in next 5 years.
- US\$300 billion planned to be spent on upgrading rail infrastructure (including new rail lines, double/multiple lines, high-speed rail) by 2020.
- Around \$55 billion worth investments planned in major and non-major ports by 2020.



# **SS Growth Drivers in India**



# SS Growth Drivers in India

## ABC

- SS roofing sheets
- Decorative and color coated SS
- Street furniture
- Escalators, elevators
- Claddings
- Railings
- Airports
- Railway station up gradation

## ART

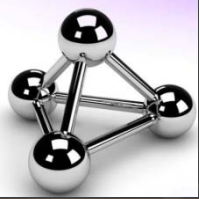
- Luxury Bus bodies
- Auto chassis, trims, suspension parts, fuel tanks, catalytic convertors
- Railway wagons and coaches
- Metro coaches

## Process & Engineering

- Nuclear grade SS for fuel containment and waste handling
- Super critical boilers in power plants
- Water treatment and drinking water supply
- Desalination applications

## Consumer Durables

- India as hub for white goods manufacturing
- SS used as components



# Stainless Steel in Railways

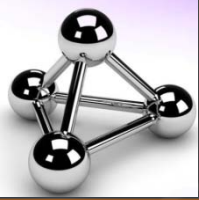


## Railways

- New Stainless Steel Wagons & Coaches
- Refurbishing Railway Stations with world class facilities
- Development of Metro Rail projects and street infrastructure



*Delhi Metro*



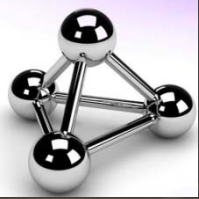
# Stainless Steel in Railways



**Railways**

Railway Stations : Cladding , Roofing , Structures ,  
Decoration , Selling Carts , Display Boards , Ticketing  
Area , Seating Space , Floor Tiles ....





# Stainless Steel in Architecture, Building & Construction (ABC)

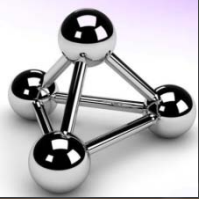


## ABC

- Urban Renewal in the form of Street furniture e.g. Bus Shelters
- Shopping Malls, organized retail is growing at rapid pace.
- Modular kitchens
- Airports



***Delhi Bus Shelter***



# Stainless Steel in Architecture, Building & Construction (ABC)



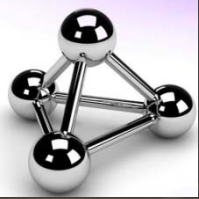
## *SS Modular Kitchen*

### New age applications in Household

- Kitchen Applications
- Bathroom Accessories
- White Goods
- Lifestyle Products
- Interior Decoration





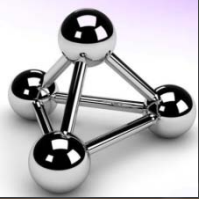


# Stainless Steel in Architecture, Building & Construction (ABC)



Airports

Wall Cladding, Roofing, Check in Area, Seating Spaces,  
Immigration Area, Railings, Display Boards, Lounge, Booths, Duty  
Free Area, Signage, Decorative, Elevators , Escalators ,  
Travelators, Food Courts....



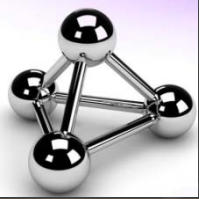
# Stainless Steel in Industrial Applications



## Industrial Applications

- Power
- Process Industry





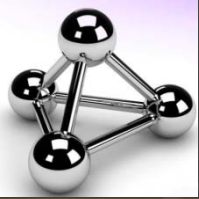
# Stainless Steel in Auto and White Goods



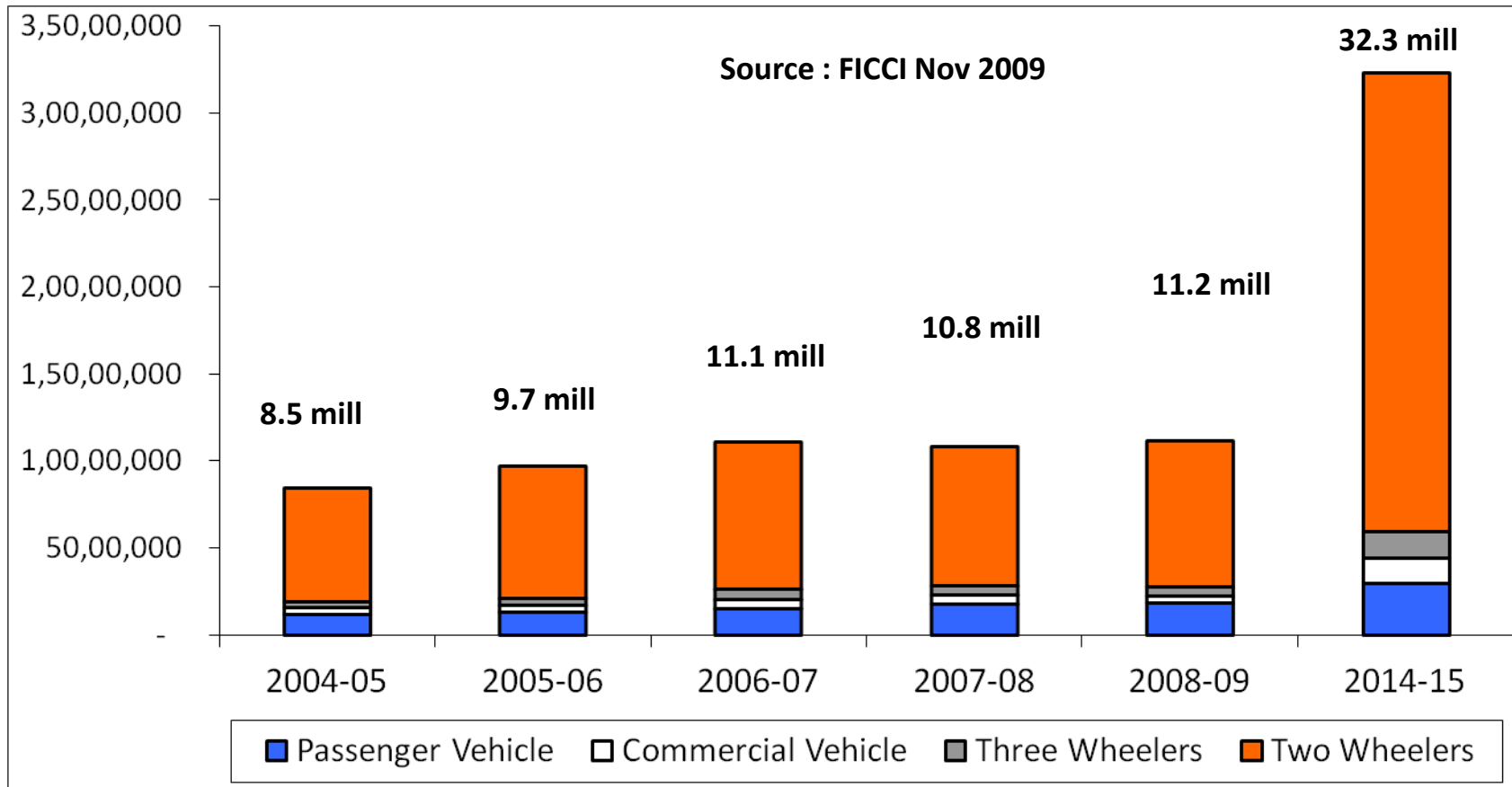
## Automotive and White goods

- India a leading automobile hub in S.Asia, specially for two wheelers and small cars
- Increase usage of Stainless Steel in exhaust, wheel rims etc.
- Large middle class driving White Goods market



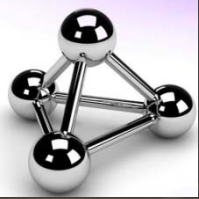


# Indian Automotive : Growth Prospects

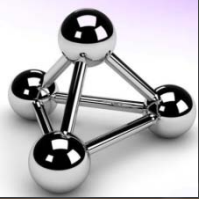


- India destined as a major Automotive hub in South Asia.
- A large manufacturing base for Two wheelers / Small cars / Steel and Stainless Steel components for automobiles.





**What Next???**



# Applications - Arriving shortly... ( India )



Bus Body

LPG Cylinder

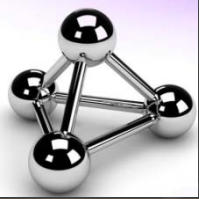
Cycle Rim

Plumbing

Hospital Furniture

Water Tanks

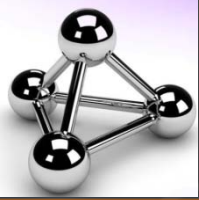
Railway Passenger  
Coaches



# Applications - Arriving shortly... ( India )



**Bicycle Rim & Gas Cylinder**

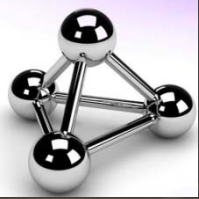


# Applications - Arriving shortly... ( India )



Plumbing





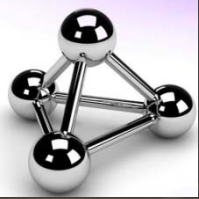
# Applications - Arriving shortly... ( India )



Water Storage Tank



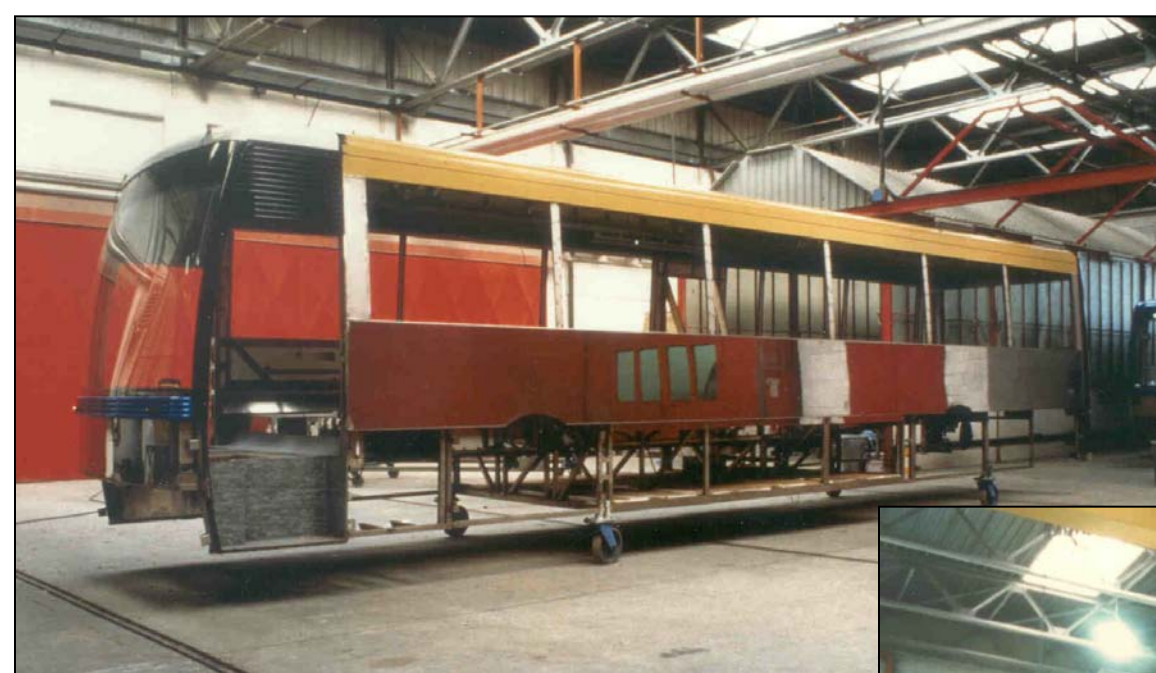




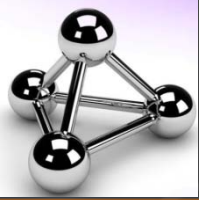
# Applications - Arriving shortly... ( India )



Bus Body





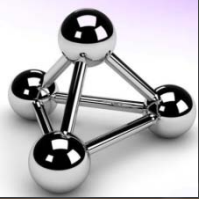


# Applications - Arriving shortly... ( India )



## Bus Body





# Applications - Arriving shortly... ( India )

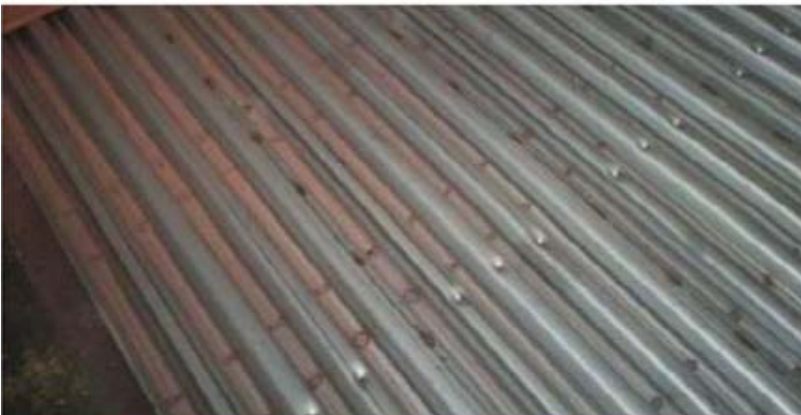
**Outer Shell – Outside View**



**Outer Shell – Inside View**



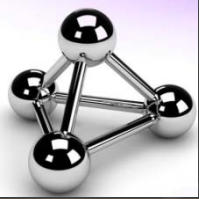
**Trough Floor**



**Connecting Door**

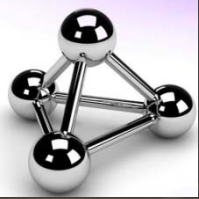


**Railway Passenger Coaches**



**But???**

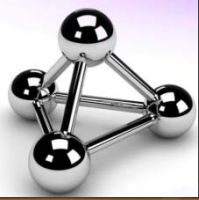




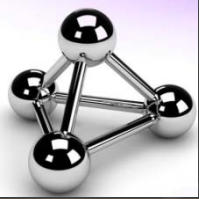
# Challenges Ahead



- ❖ **Inadequate Infrastructure – Energy, logistics, ports etc. not conducive to growth of manufacturing sector**
- ❖ **Infrastructure projects subject to delays and financial constraints**
- ❖ **Budget constraints Vs. Life Cycle benefits of Stainless Steel**
- ❖ **Dependence on imports for certain raw material – Nickel, SS Scrap , Moly.**



**Watch For....**



# Changes in the Market Place...



## Railway

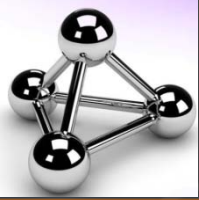
- Metro in major cities
- Railway Wagons
- Coach Up-gradation
- SS usage in Platforms

## Increasing ABC applications

- Selective Rebar's
- Door & Windows
- Cladding
- Signage's
- Street Furniture
- Fasteners
- Life Style products

## India as export hub for

- Auto Components
- Appliances
- Mill Products
- High Quality Value Added Engineering Products

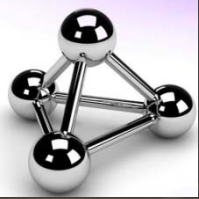


# Movements in environment.....



- **RM Price Fluctuations ( Ni, Cr, Scrap )**
- **Grade / Series Substitution in Industry**
- **Standardization (IKEA/ Whirlpool / Electrolux moving to 400 Series)**



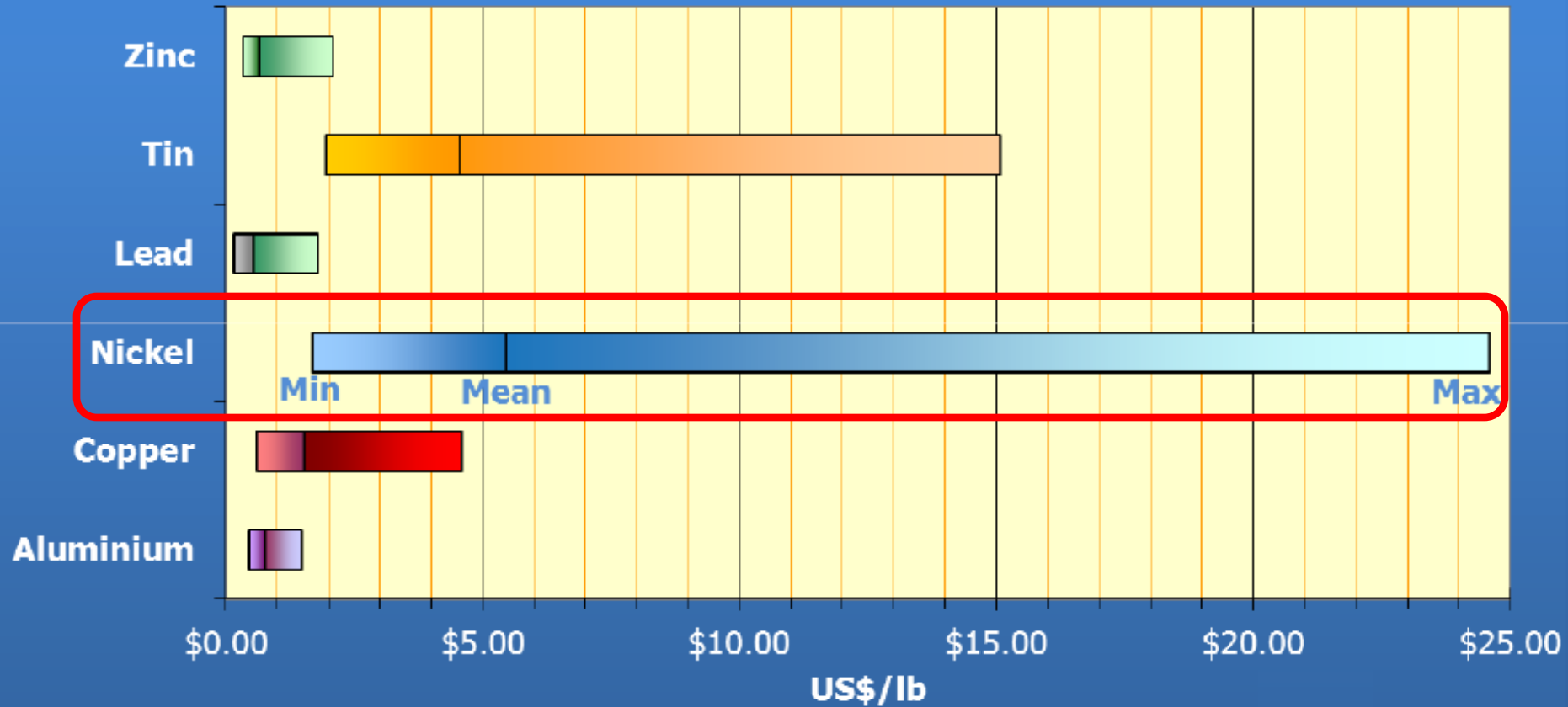


# Raw Material : Price Volatility

Since 1990

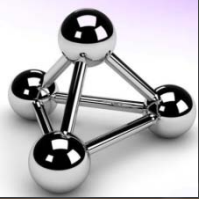


Ranges of Daily Base Metal Prices since 1990



Nickel (key Raw Material for Stainless Steel) trades over a wider Price Range than other base Metals.

Source : Metalytics

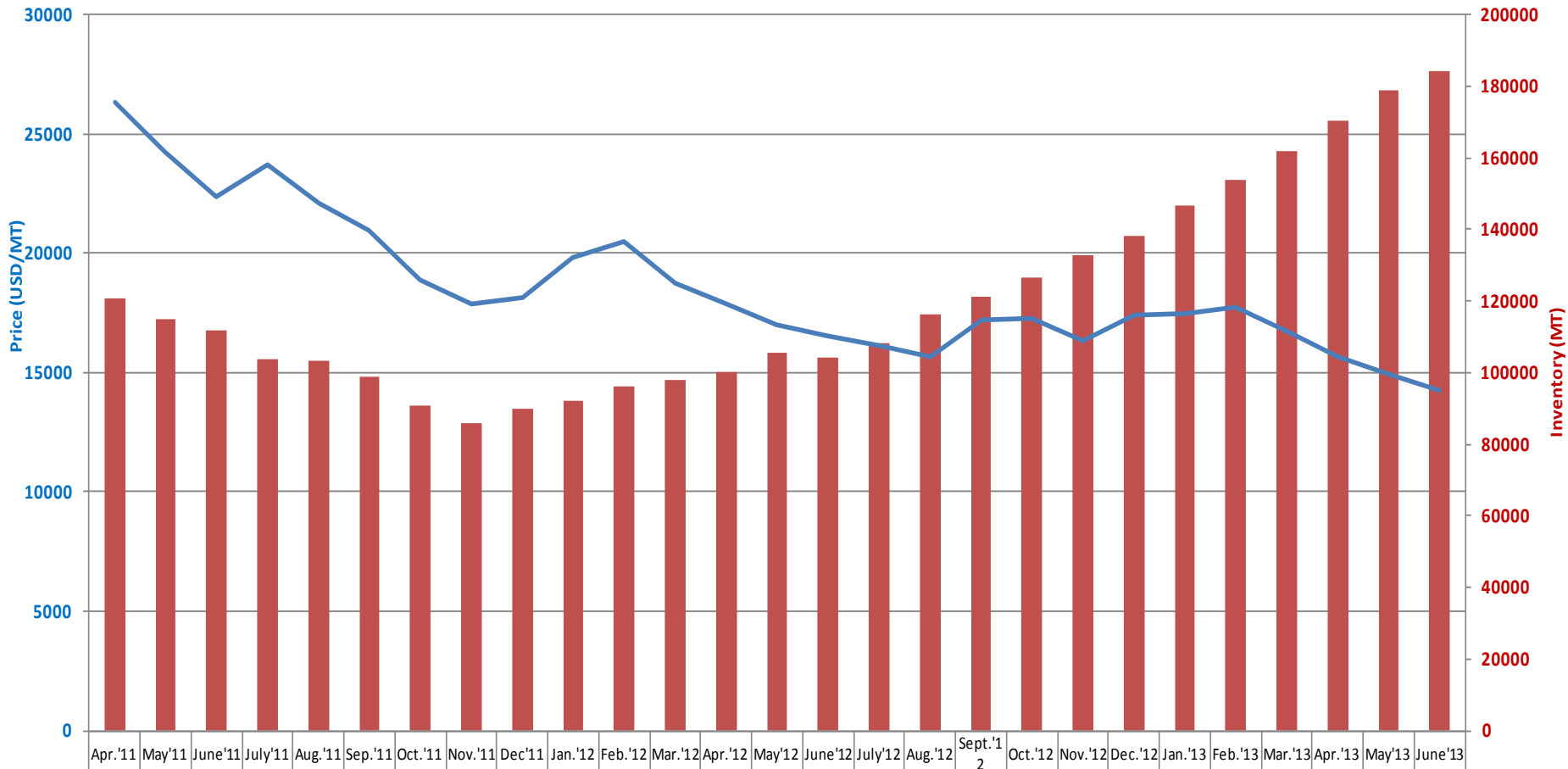


# LME Nickel Volatility

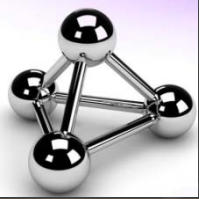
## Key Raw Material for Stainless Steel



■ LME Inventory (MT)    ◆ Price (USD/MT)



LME Inventory (MT)	120660	114989	111889	103529	103399	98999	90913	85717	89879	92281	96123	98048	100123	105595	104171	108062	116096	121049	126435	132797	138225	146539	153634	161880	170443	178922	184010
Price (USD/MT)	26329	24210	22354	23731	22084	20932	18886	17882	18154	19822	20465	18710	17897	17020	16539	16159	15658	17216	17245	16298	17407	17465	17734	16728	15635	14951	14271



# Indian Stainless Steel Industry Outlook



## Prospects

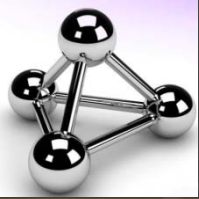
- High growth economy
- Increasing SS consumption

## Growth Area

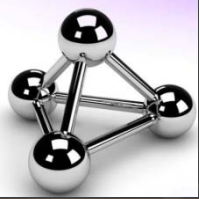
- ABC (Architecture, Building & Construction)
- Automobile
- Railways

## Challenges

- Indian Infrastructure
- China Capacities
- RM Volatility

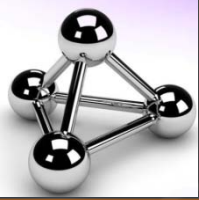


**Summing up ++**



## *Indian Stainless Steel Market*

- ❖ **SS Production will go up to 3.5 Million Tons by 2015**
- ❖ **Overcapacity in the market .. export boost up**
- ❖ **Scope for double digit growth in SS Consumption**  
**(Growth in SS Consumption is about 1.2 Times GDP )**
- ❖ **New applications will emerge very fast**
- ❖ **Opportunities for business in downstream industries**
- ❖ **SS will change the face of India**



Contact at : [ncm@stainlessindia.org](mailto:ncm@stainlessindia.org)