



## **SHRI RAM VILASJI PASWAN**

**HON'BLE UNION MINISTER FOR CHEMICALS, FERTILIZERS & STEEL  
GOVERNMENT OF INDIA**

# INDIAN MANGANESE ORE AND ALLOY SCENARIO



Kishan Lal Mehrotraa  
Chairman-cum-Managing Director  
Manganese Ore (India) Limited

# INTRODUCTION

Manganese is fourth most used metal in terms of tonnage, being ranked behind iron, aluminum and copper within the order of 34 million tonnes of ore being mined annually (2006) in the world.

Manganese has played a key role in development of various steel making processes.

The continuing importance of manganese is indicated by the fact that about 90% of all manganese consumed annually goes into steel as an alloying element.

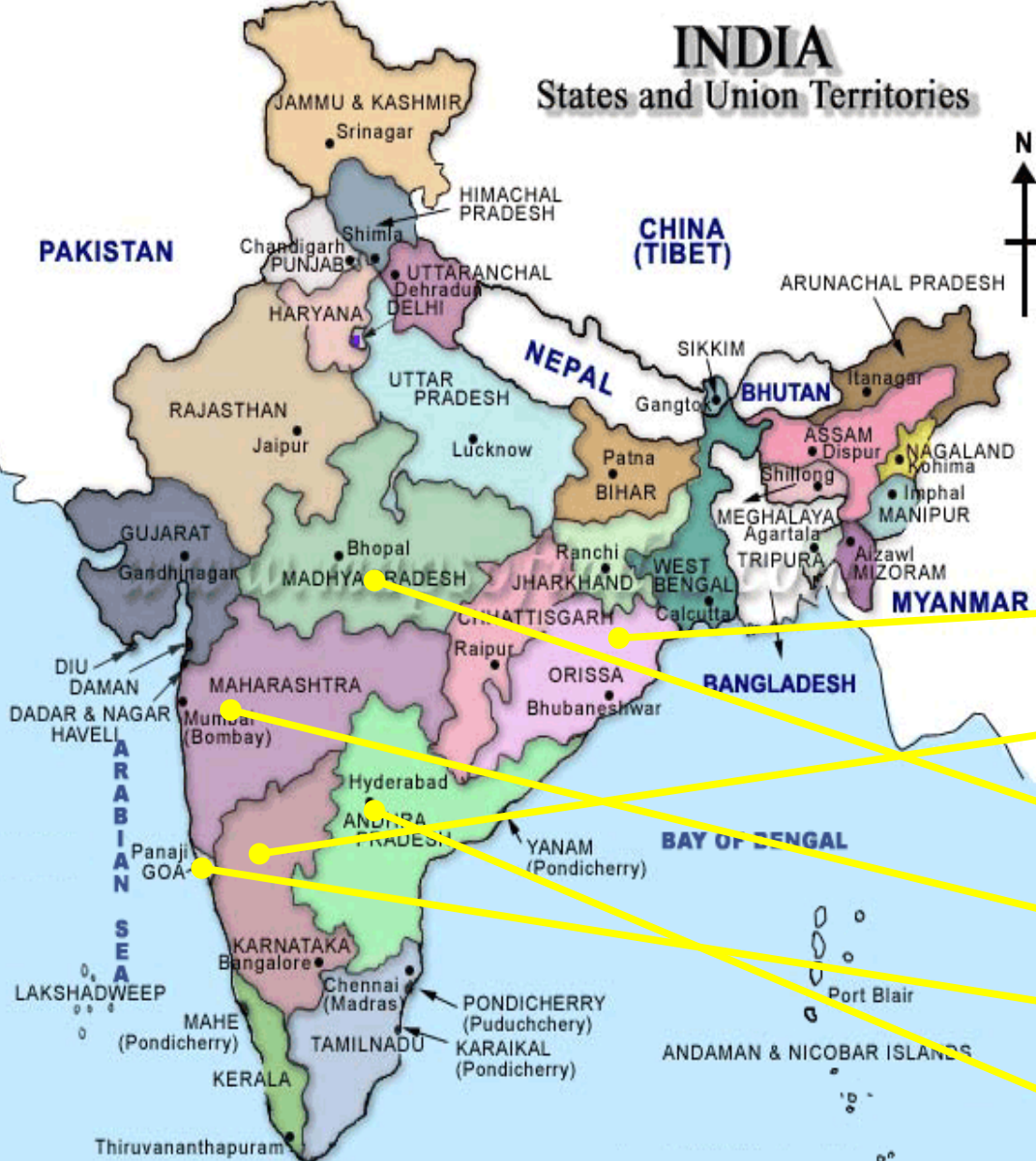
# INTRODUCTION

No satisfactory substitute for manganese in steel making has been identified which combines its relatively low price with outstanding technical benefits. This is unlikely to change.

After steel, the second most important market for manganese, in dioxide form, is that of portable dry batteries and chemicals.

# INDIA

States and Union Territories



## MANGANESE ORE RESERVES IN INDIA - 2005

Resource Category	191 million Tonnes
Reserves Category	104 million Tonnes
<b>TOTAL</b>	<b>295 million Tonnes</b>

103.7 million tonnes (35%)

86.6 million tonnes (29%)

28.4 million tonnes (10%)

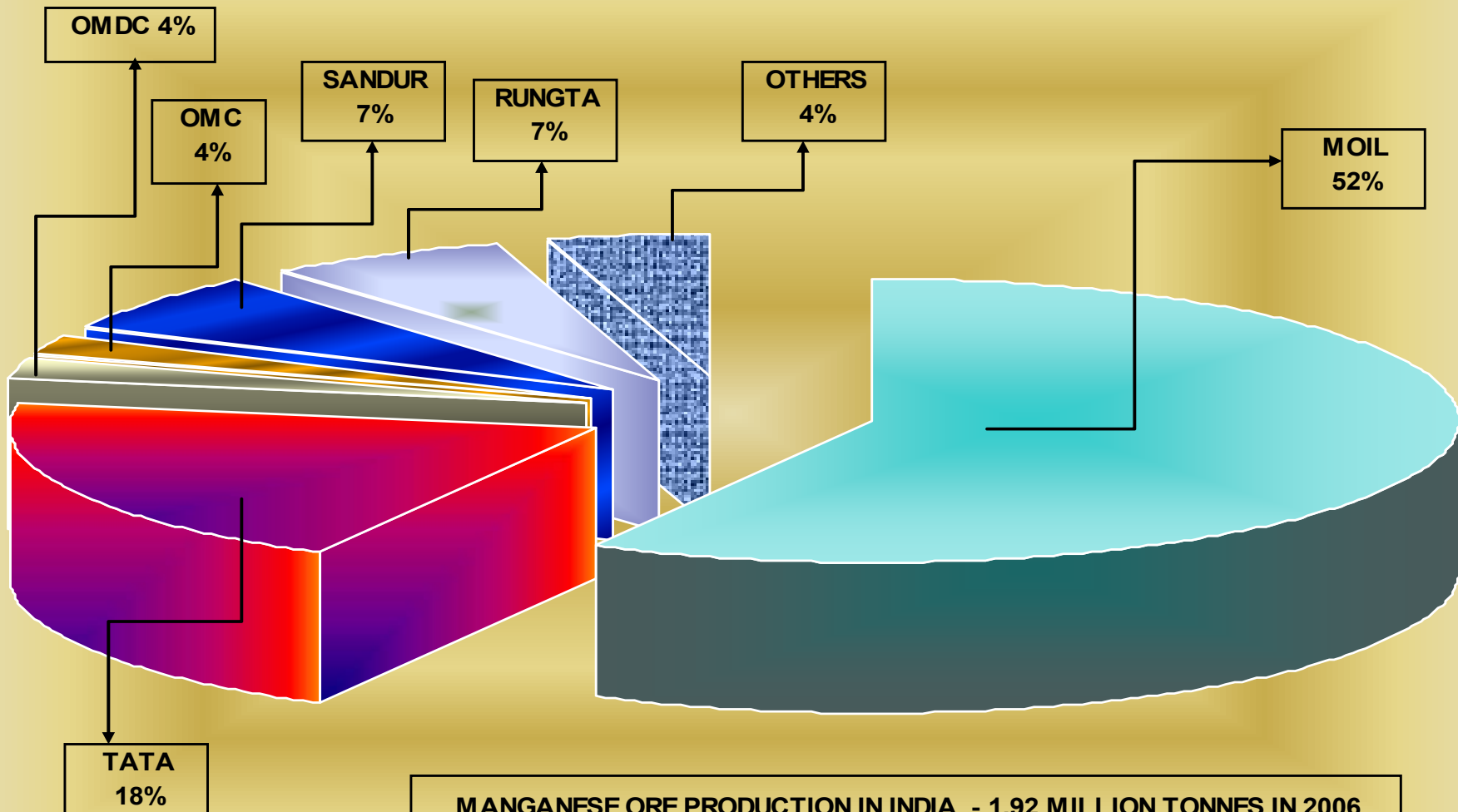
22.2 million tonnes (8%)

23.3 million tonnes (8%)

18.3 million tonnes (6%)

Others: 4%. (Source: IBM)

# Share of Manganese Ore Production in India in Million Tonnes



MANGANESE ORE PRODUCTION IN INDIA - 1.92 MILLION TONNES IN 2006

# Indian Manganese Ore & Alloy Scenario

- The Indian Steel production has been witnessing an increasing trend in the past few years.
- The competitive opportunities are being seen in the steel intensive industries such as automobiles, construction, infrastructure development, etc.
- These industries have demonstrated huge growth potential for steel in the domestic market.

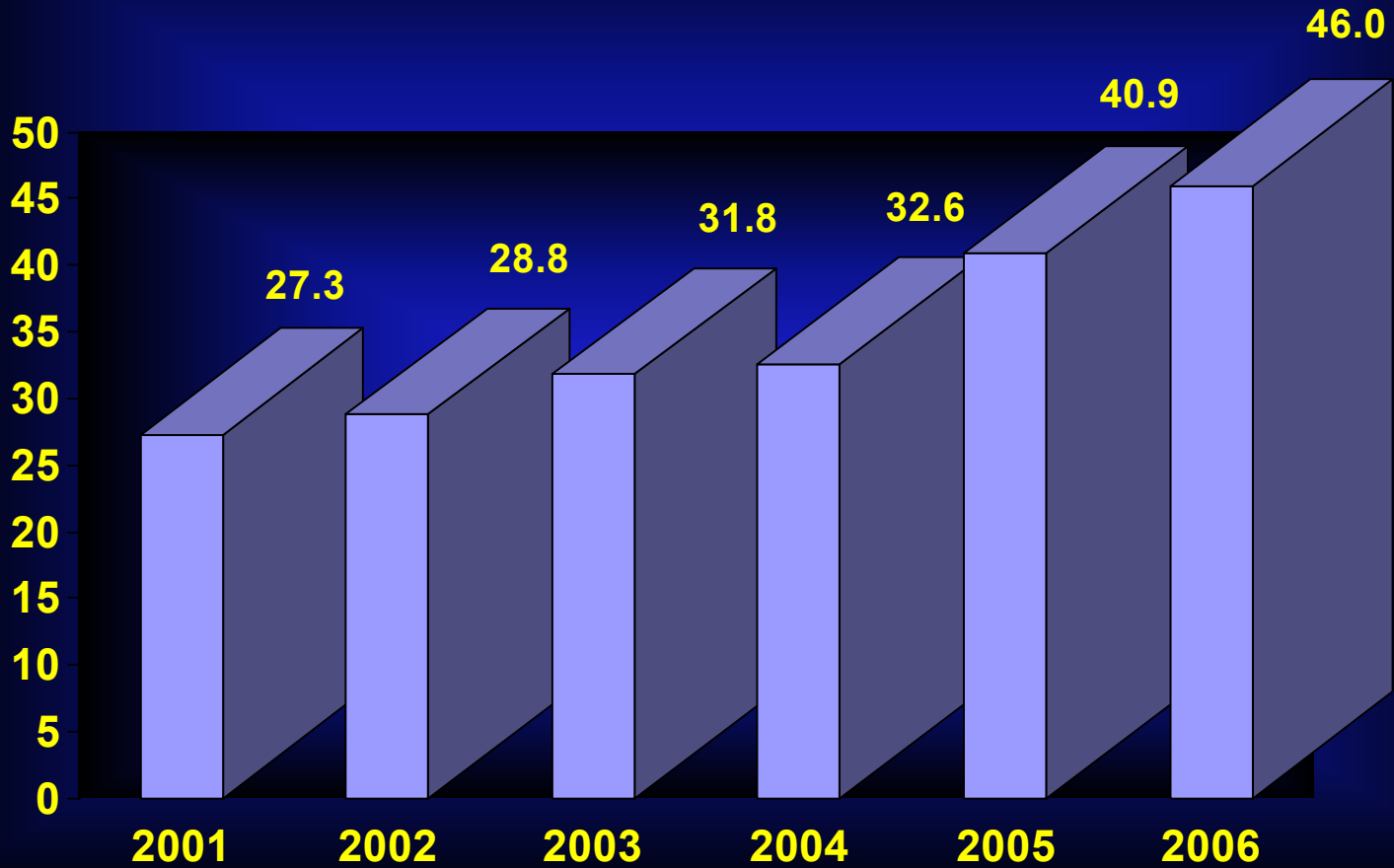
## PROJECTION OF STEEL PRODUCTION OF PSUs – ‘000 tonnes

Location	Capa- city (kt)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
	15,507	16,738	17,481	18,314	18,814	21,514	23,260	30,000
Vishaka- patnam	3,000	3,560	3,606	3,900	4,000	6,000	6,300	7,000
Bhilai	3,925	5054	4,726	5,054	5,254	5,454	6,000	7,000
Bokaro	4,360	4,228	4,529	4,700	4,800	5,000	5,500	7,000
Burnpur	520	434	460	500	500	500	500	3,000
Durgapur	1,802	1,801	2,012	2,012	2,212	2,412	2,812	3,000
Rourkela	1,900	1,661	2,148	2,148	2,048	2,148	2,148	3,000

## Capacity of proposed new steel projects by 2012-13 Under (Private Sector)

Sl.No	Name of Company	Proposed Capacity (Million Tonnes)
1	Tata Steel (Jharkhand)	3.0
2	Tata Steel (Chhatisgarh)	5.0
3	Tata Steel (Orissa)	6.0
4	Mittal Steel (Orissa/Jharkhand)	6.0
5	POSCO India (Orissa)	6.0
6	Essar, JSW Steel, Plant, JSPL Industries	4.0 to 5.0 each
7	SAIL,NMDC,RINL	5.0
8	SINO Steel	5.0

# Indian Steel Production – Million Tonnes



# Indian Manganese Ore & Alloy Scenario

- According to National Steel Policy, the projected steel production is 60 million tonnes by 2009-10 and 110 million tonnes by 2020.
- The Indian steel makers have announced new projects which if all goes well, will by 2012-13 add staggering 50 million tones and as a result of this, the projected steel production would be around 95 million tones as per the industry sources.

## PROJECTED REQUIREMENT OF FERRO ALLOYS BY STEEL PSUs (‘000 tonnes)

Public Sector Plants		CY 2006	CY 2007	CY 2008	CY 2009	CY 2010	CY 2011	CY 2012
<b>TOTAL</b>		<b>207</b>	<b>217</b>	<b>227</b>	<b>238</b>	<b>278</b>	<b>301</b>	<b>402</b>
RINL	Vizag	40.0	40.5	43.8	44.9	75.0	78.8	87.5
SAIL	Bhilai	64	60	64	67	69	76	91
SAIL	Bokaro	54	58	60	61	64	70	91
SAIL	Burnpur	6	6	6	6	6	6	39
SAIL	Durgapur	23	26	26	33	36	42	54
SAIL	Rourkela	21	27	27	26	27	27	39

**Demand & Supply of Manganese Ore, Ferro Alloys  
for the projected Steel including Stainless Steel production in India  
(In million tonnes)**

<i>Year</i>	<i>Steel Production</i>	<i>Stain- less Steel Produc- tion</i>	<i>Total Steel Produc- tion</i>	<i>Ferro Alloys</i>	<i>Mn.ore Demand</i>	<i>Projected Mn. Ore Availability</i>	<i>Demand Gap of Mn. Ore</i>
<i>2006</i>	42.00	2.00	46.00	0.76	1.93	1.90	0.03
<i>2010</i>	60.00	3.00	63.00	1.20	3.07	2.20	0.87
<i>2012(*)</i>	95.00	3.00	98.00	1.78	4.36	2.50	1.86
<i>2020</i>	110.00	5.00	115.00	2.14	5.60	2.80	2.80

(\*) As per Industry Sources

**Indian Stainless  
Steel  
Industry  
An Overview**

# Indian Stainless Steel Outlook

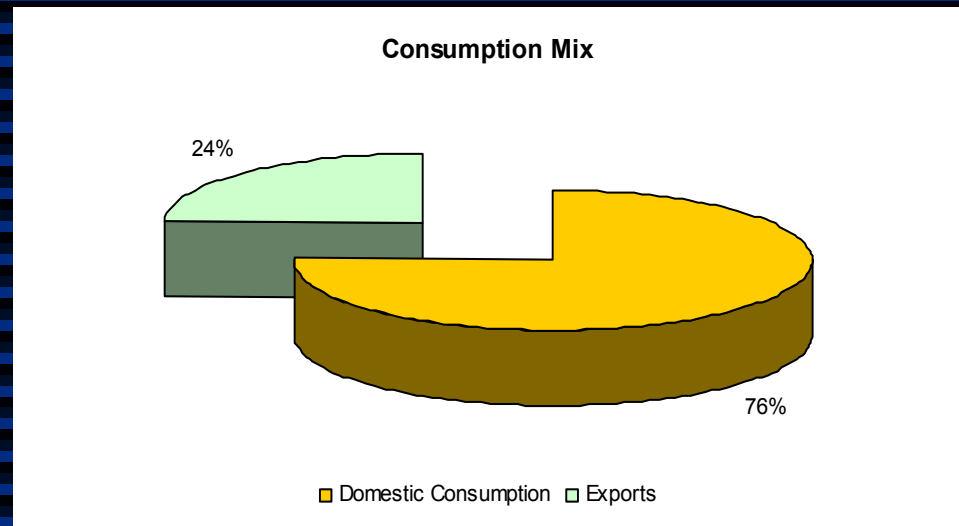
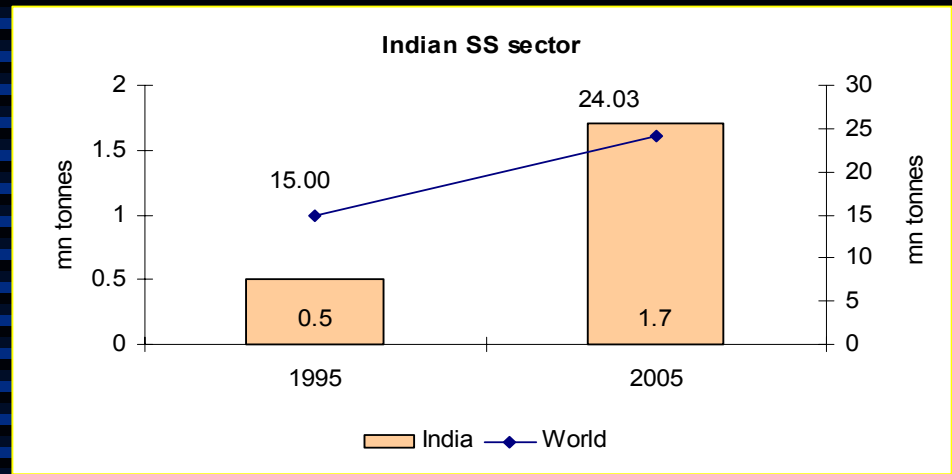
- India with apparent consumption of 1.2 mt placed 7<sup>th</sup> in terms of global stainless steel consumption
- Indian consumption growth over last decade at 13%
- Indian per capita consumption of stainless steel of 1.1 kg is far lower than **China (1.6 kg in 2000 to 5.3 kg in 2006)** & developed countries in range of 15-20 kg
- Jindal Stainless contributes 35% to domestic stainless steel production
- Potential for high growth -
  - higher expected growth in GDP & Industrial production
  - existing low per capita consumption
  - Availability of key natural resources like manganese and chrome ore
  - low manpower cost

---

**Indian stainless steel demand expected to grow by 12% annually**

# Growth of Stainless Steel Sector in India

- More than 1.7 million tonnes of SS was produced in India in 2005.
- As a result India's share of global production has also doubled in last 10 years.
- Almost 76% of the production is consumed domestically while the remaining is exported.



# Potential for Stainless Steel in Architecture, Building & Construction in India

- Railways
- Airports
- Municipal / Urban Local Bodies (ULBs)
- Commonwealth Games
- Malls
- Hospitals
- Tourism & Hotels
- Housing

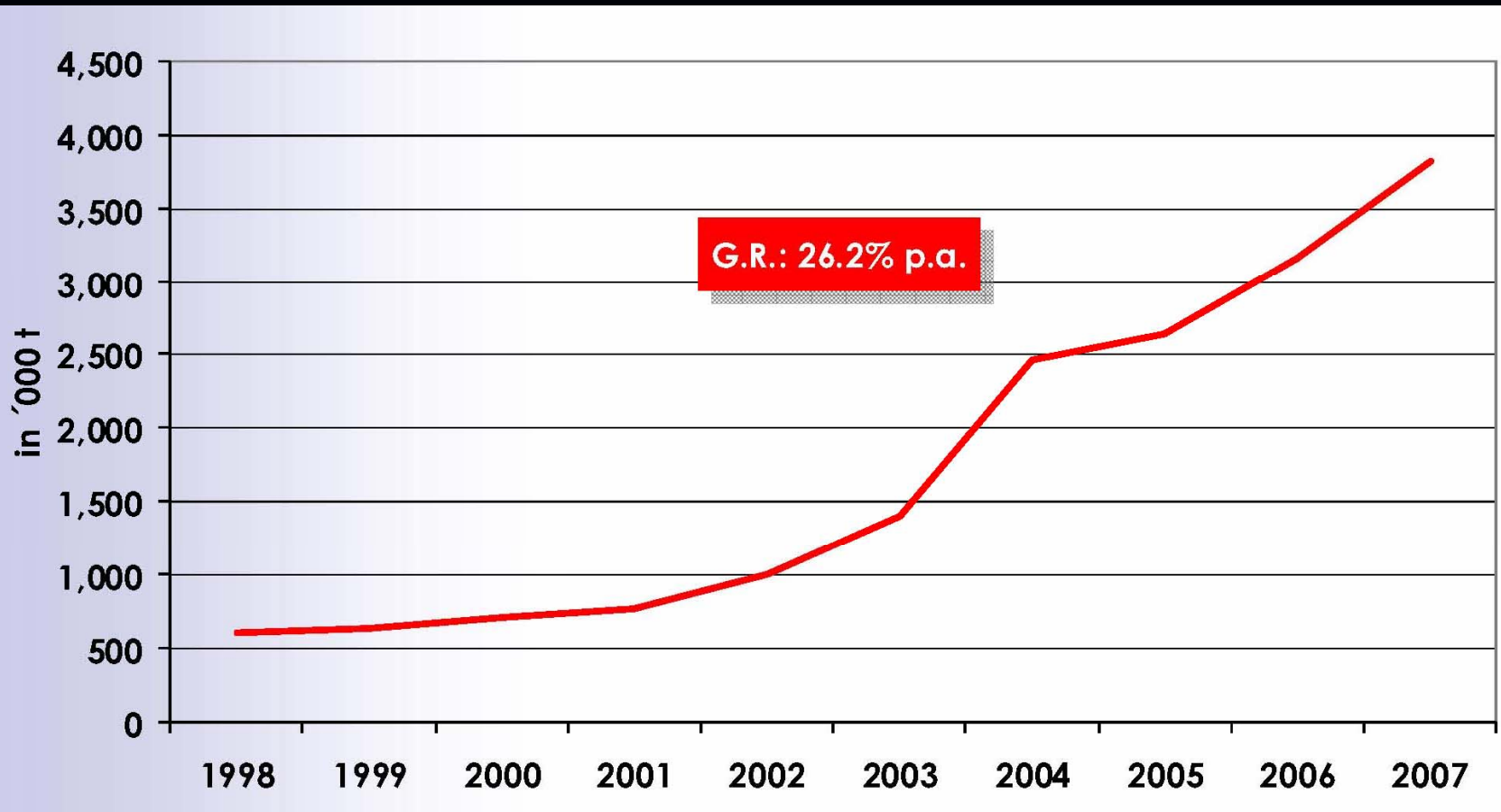
**Evolution  
of  
Cr-Mn Austenitic  
(200 Series)  
Stainless Steel in India**

# Cr-Mn Stainless Steel

- **Softer Alloys Preferred**
- **Half of Nickel only replaced by Mn & N**
- **AISI Designation in 1955 to 201 & 202**

Grade	C	Cr	Mn	N	Ni
201	0.15 max	16.0-18.0	5.5-7.5	0.25max	3.5-5.5
202	0.15 max	17.0-19.0	7.5-10.0	0.25max	4.0-6.0

# Global Cr-Mn Supply Structure



# 2010 Product Mix

Grades	1998	2007	2010	
		in Mill t		in %
Austenitic	12.3	19.9	19.0	52.6
Low Ni CrMn	0.6	3.8	8.1	22.4
Ferritic	4.0	7.4	9.0	24.9
<b>Total</b>	<b>16.8</b>	<b>31.0</b>	<b>36.1</b>	<b>100.0</b>

# Stainless Steel in Asia

## Asian Region in 2006

- Production : 15 million ton
- Growth : +20.6% over the year 2005

# Future Action for Stainless Steel is in Asia

*Trend will continue led by China & India with 40% of World's population*

# Action Plan of MOIL to meet the increased demand of Mn. Ore

- MOIL has geared up to meet the increased demand by taking the following steps:
  - Increase production by mechanization of mining operations
  - Increase production by improving the recovery through mineral beneficiation. MOIL has set up 4.0 lakh tonnes per annum beneficiation plant at Dongri Buzurg Mine. Another beneficiation plant with 500,000 tonnes / year capacity is under construction at Balaghat and expected to be commissioned by May / June 2007.
  - Increase production by deepening of shafts at Balaghat Mine and sinking of new vertical shafts at Gumgaon, Beldongri and Ukwa Mines.

## **Action Plan of MOIL to meet the increased demand of Mn. Ore**

- MOIL has taken up large scale exploration programme to augment the reserves in the leasehold areas. About 6000 Mtrs. of drilling is being carried out annually and during the last 5 years about 30,000 meters of exploratory drilling has been carried out. The Company has been able to prove 5.3 million tonnes IN-SITU reserves equivalent to 1.32 million tonnes of cleaned ore.
- In addition to the above, the Company has engaged Mineral Exploration Corporation Ltd. (MECL) a PSU for carrying out exploratory drilling of about 3000 Mtrs., out of which 1700 Mtrs. Of exploration has been completed.

## **Action Plan of MOIL to meet the increased demand of Mn. Ore**

- The Company is proposing to set up sintering plant for agglomeration of high grade fines generated from the beneficiation plant to enhance availability of sintered mix to be used in the ferro alloy industry.
- Through large scale opencast and underground development to increase production.
- Improvement in Productivity (Output per manshift) through mechanization and incentive schemes to workers. The productivity has been on the increase over the years and is currently 0.660 tonnes.

## Action Plan of MOIL to meet the increased demand of Mn. Ore

- With the above action plan, MOIL will be in a position to achieve a production of 1.2 million tonnes by the year 2009-10 which enable the Company to maintain its market share of 50% of the demand projections during 2010.
- As per the National Steel Policy, the steel production would be 110 million tonnes by 2020. To achieve this projection, the total requirement of manganese would be 4.97 million tonnes. After taking into account the projected production of 1.5 – 1.6 million tonnes from MOIL by 2020, there would be a demand gap of about 2.17 million tonnes.

# Action Plan of MOIL to meet the increased demand of Mn. Ore

- MOIL is exploring the possibilities of Joint Venture in the following areas:
- Optimum utilization of Manganese Ore of different grades and blends for meet the demand commensurate with the growth of Steel Industry.
- South Africa has 4000 million tonnes of proven reserves which constitutes about 80% of the World Reserves of manganese ore but accounts for only 25% of the World's production
- Exploring the possibilities of acquiring manganese bearing deposits in South Africa through Joint Venture.

Thank You