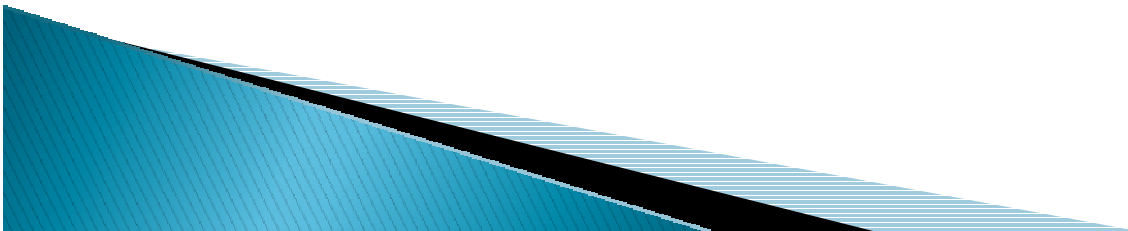
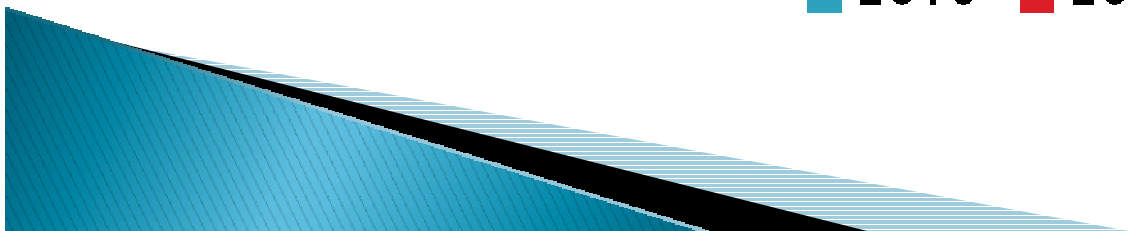
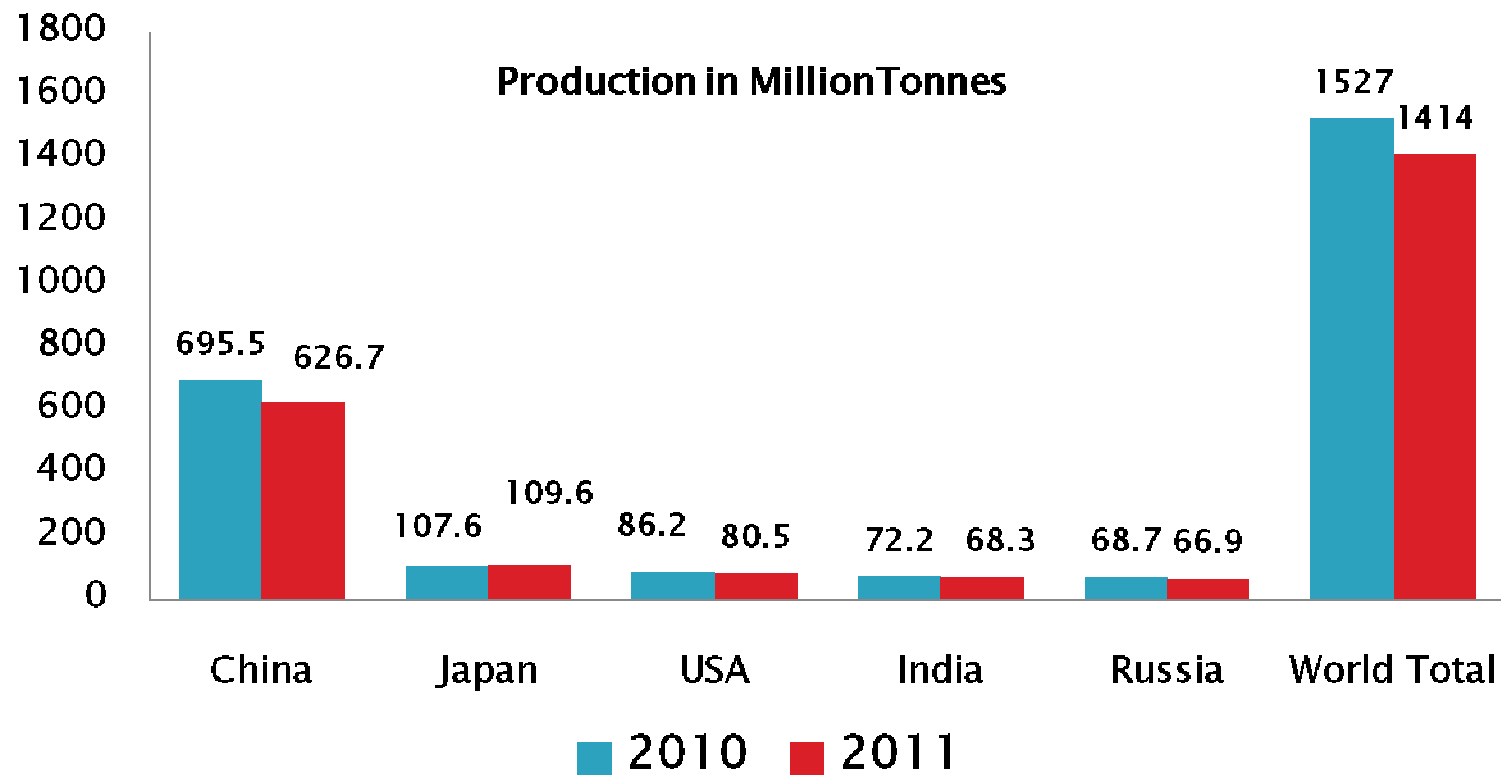


**MANGANESE ORE,
CHROME ORE,
FERRO ALLOYS**



GLOBAL STEEL PRODUCTION

- In 2011 World Crude Steel Production reached 1527 million tonnes and showed a growth of 6.8% over 2010 and China remained the World's largest crude steel producer in 2011 (695.50 Million tonnes)

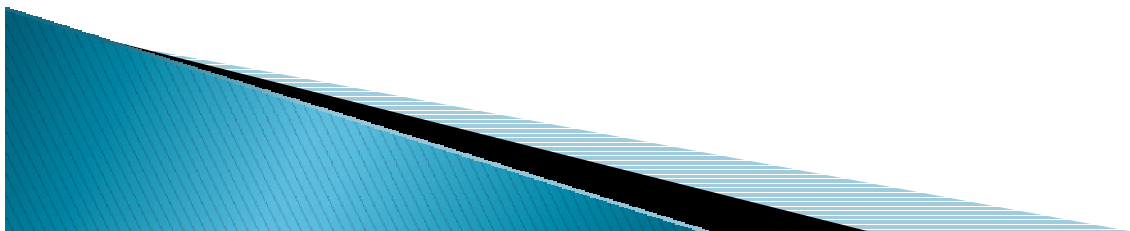


INDIA'S PROJECTED STEEL PRODUCTION AND DEMAND

In Million tonnes

	12-13	13-14	14-15	15-16	16-17
Projected Steel Demand	75.30	84.06	94.10	105.10	115.30
Crude Steel Production	85.90	94.50	104.00	114.50	125.90
Iron Ore	135.70	149.43	166.66	185.24	206.18
Coking Coal	52.29	57.91	67.49	77.23	90.16

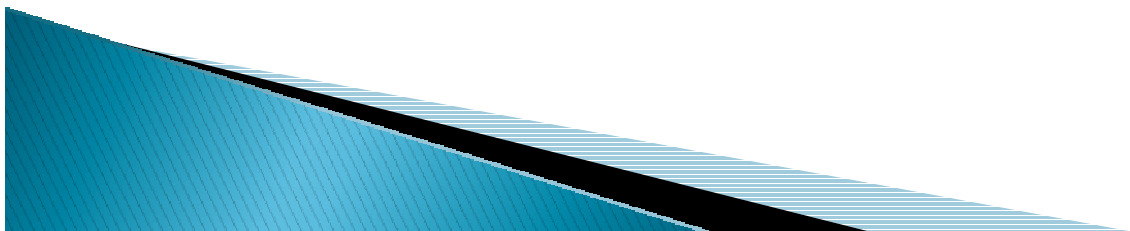
Source: Report of Working Group on Steel Industry 2012-17.



PRODUCTION DURING 11TH FIVE YEAR PLAN PERIOD

In Million Tonnes

	07-08	08-09	09-10	10-11	11-12 <i>(Provisional)</i>
Manganese Ore	2.70	2.80	2.44	2.86	2.60
Chromite Ore	4.87	4.07	3.14	3.36	3.50
Silico Manganese	0.95	0.94	1.12	1.30	1.26
Ferro Manganese	0.38	0.39	0.36	0.40	0.54
Ferro Silicon	0.09	0.11	0.09	0.12	0.14
Ferro Chrome	0.97	0.79	0.89	1.03	1.06



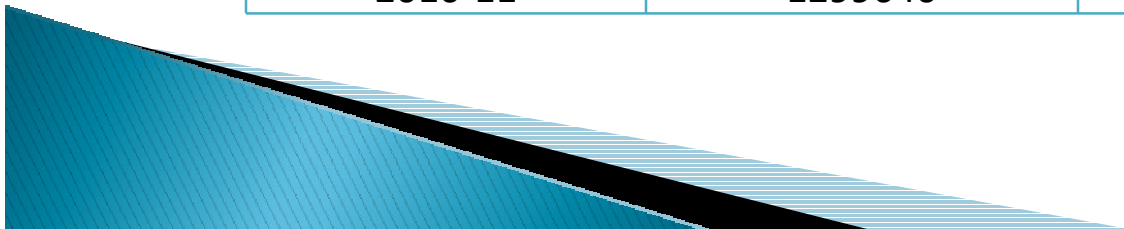
Manganese Ore & Chromite Ore : Export and Import Trend

Export of Manganese Ores & Chromite Ore

Year	Quantity (in tonnes)	
	Manganese Ore	Chromite Ore
2005-06	237344	693000
2006-07	157312	1203000
2007-08	208372	907000
2008-09	205424	1899000
2009-10	289468	689000
2010-11	117963	N.A

Import of Manganese Ore & Chromite Ore

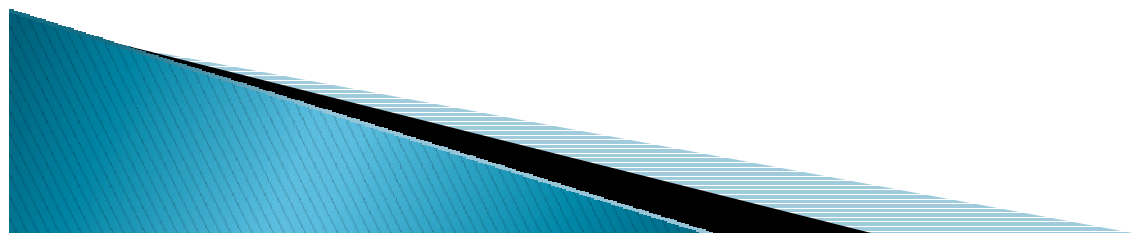
Year	Quantity (in tonnes)	
	Manganese Ore	Chromite Ore
2005-06	13281	5000
2006-07	284202	5000
2007-08	686053	121000
2008-09	852198	94000
2009-10	797933	96000
2010-11	1299640	N.A.



PROJECTED DEMAND DURING 12TH FIVE YEAR PLAN PERIOD

In Million Tonnes

	12-13	13-14	14-15	15-16	16-17
Manganese Ore	4.54	4.98	5.57	6.18	6.82
Chromite Ore	2.90	3.19	3.52	3.93	4.31
Silico Manganese	1.42	1.56	1.74	1.94	2.16
Ferro Manganese	0.51	0.57	0.64	0.70	0.86
Ferro Silicon	0.26	0.28	0.31	0.34	0.38
Ferro Chrome	1.16	1.28	1.41	1.57	1.73
Refractories	1.29	1.42	1.56	1.74	1.89



**PROJECTED DEMAND SUPPLY GAP OF MANGANESE ORE & CHROMITE ORE
DURING 12TH FIVE YEAR PLAN PERIOD**

In Million Tonnes

Year	2012-13	2013-14	2014-15	2015-16	2016-17
MANGANESE ORE					
Production	3.21	3.43	3.67	3.93	4.20
Demand	4.54	4.98	5.57	6.18	6.82
Demand Gap	(-) 1.00	(-) 1.55	(-) 1.90	(-) 2.25	(-) 2.62
CHROMITE ORE					
Production	3.75	4.01	4.29	4.59	4.91
Demand	2.90	3.19	3.52	3.93	4.31
Demand Gap	(+) 0.85	(+) 0.82	(+) 0.77	(+) 0.66	(+) 0.60

- ❖ There will be a shortage of manganese ore in the country.
- ❖ There will be sufficient production of chromite ore, Ferro chrome, Silico Manganese and Ferro manganese to meet the required projected demand during the 12th Five year plan.
- ❖ Around 50% to 60% of the projected demand of the Ferro Silicon shall be met by imports.
- ❖ About five Lakhs MT of Refractories is required to be imported to meet the projected demand by the end of 12th plan period i.e. 2016-17.

Resources and Reserves of Manganese Ore in India

- Based on IBM's Report of 1-4-2010, the requirement of Manganese Ore for ferro alloy industry will be available domestically for 20 years(excluding the Inferred Reserves). The All India resources are measured at 430 million tonnes out of which 142 million tonnes are in the reserves category and the remaining 288 million tonnes falls under resources category.
- High grade reserves are limited to only 20% of the total reserves.

Conclusions & Recommendations

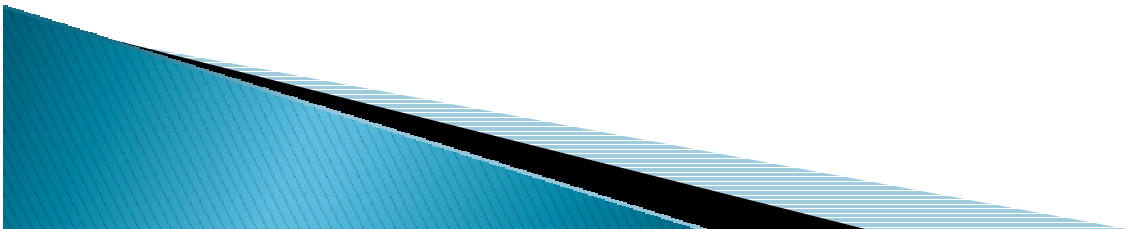
MANGANESE ORE:

- ❑ Manganese ore production will have to be raised to fully meet the domestic demand by enhancing output from the existing mines and by opening additional virgin deposits. The industry can raise supply of manganese ores by acquiring mines overseas.
- ❑ Focused attention is needed to ensure higher rate of recovery of manganese and improve the quality of the ores by engaging beneficiation and sintering processes.
- ❑ Geological Survey of India (GSI) may undertake extensive drilling to identify new ore deposits in higher depths. Deep-sea nodules can be a potential resource for manganese in the future.
- ❑ Renewal of mining leases and grant of new leases can be expedited by a single window clearance system especially in respect of obtaining environment and forest clearances



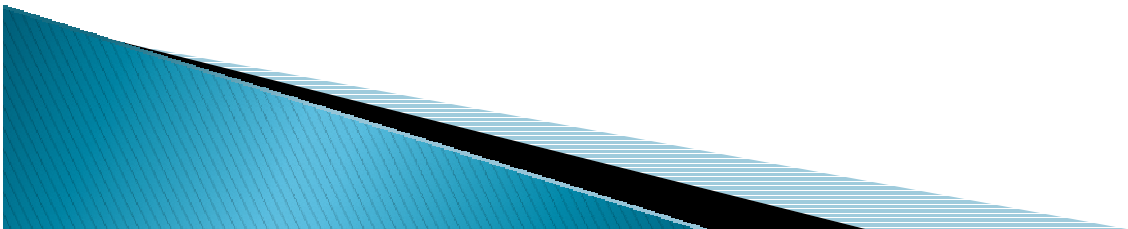
Conclusions & Recommendations

- Since the manganese ore is not widely traded and there is no benchmark price domestically available, it is desirable that a third party and neutral e-market portal may be developed. The industry, both the ore producers and the ore consumers such as ferro-alloys and the steel, may together support such a venture.
- R & D is required for reclamation of old mined out areas, and to ascertain the impact of manganese mining on the ecology (air and water).



Resources and Reserves of Chromite Ore in India

- ▶ As per UNFC system, total resources of Chromite in the country as on 1.4.2010 are estimated at 203 million tonnes, comprising 54 million tonnes reserves (26%) and 149 million tonnes remaining resources (74%).
- ▶ Sukinda Valley in the State of Orissa has 97% of Indian Chromite Ore deposits and has one of the largest Chromite Ore mines in the world.



Conclusions & Recommendations

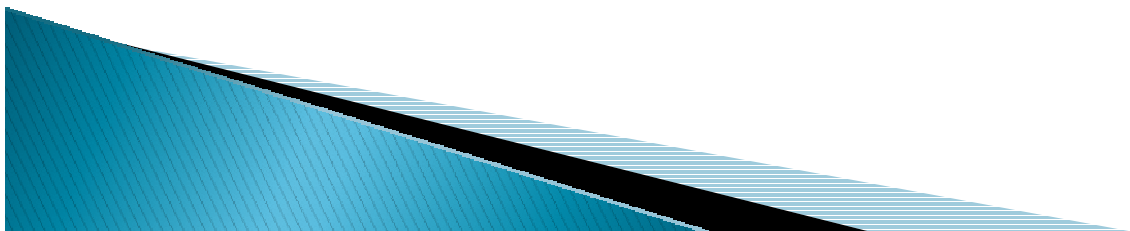
CHROME ORE:

- ❑ Extensive exploratory drilling through national agency is required to convert the remaining resources of 149 million tonnes of chrome ore into the reserve category and to explore new areas for addition of mine reserves.
- ❑ The ore deposits of Sukinda valley of Odisha are generally of friable nature and all of them are the open pit mines which have reached the optimum pit limit. The stripping ratio in some cases has reached 1:20 and therefore immediate efforts are required for underground method of mining.
- ❑ A comprehensive planning to develop the Sukinda Valley through some national agency is essential in order to make the entire mining of the area more scientific, systematic and planned.
- ❑ It is expected that domestic production may be sufficient to meet the requirement of Ferro-Chrome production required for projected steel production by the terminal year of the 12th Five year plan.



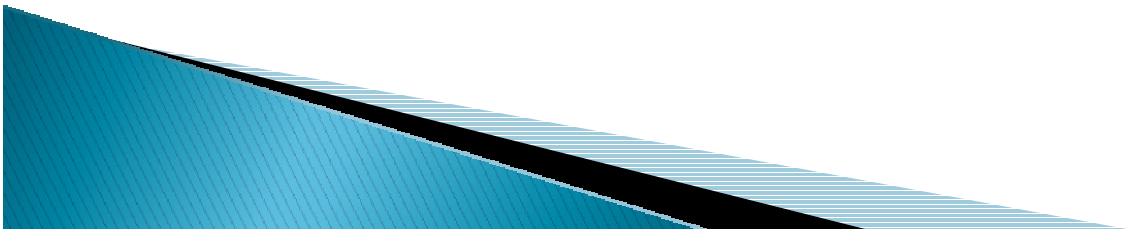
Conclusions & Recommendations

- India exports 30–35% of the world share of chrome ore. With the present trend of export, the resources of chrome ore in the country may not last very long. Therefore, there is an urgent need to conserve this critical input for the use of domestic industry and bring in effective fiscal/ other measures to curb exports.



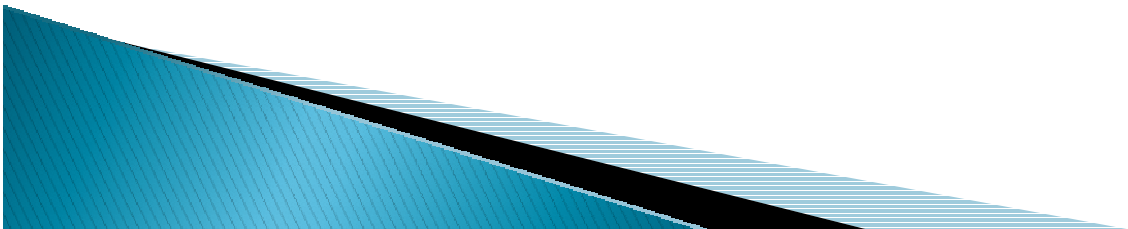
Ferro Alloys

- ▶ The modern-day Indian ferro alloy industry is concentrated largely in the East and West with a modest representation in the South and virtually negligible in the North. The four regions –East, West, South and North – respectively account for 48%, 37%, 11% and 4% of the total number of units in the country.
- ▶ The top 5 states with maximum concentration of units include West Bengal (37 units), Chhattisgarh (32 units), Maharashtra (27 units), Orissa (25 units) and Andhra Pradesh (18 units) and together, they account for 69% of total number of units in the country.
- ▶ Total capacity surveyed : 4.837 or 4.84 million tonnes (mt)



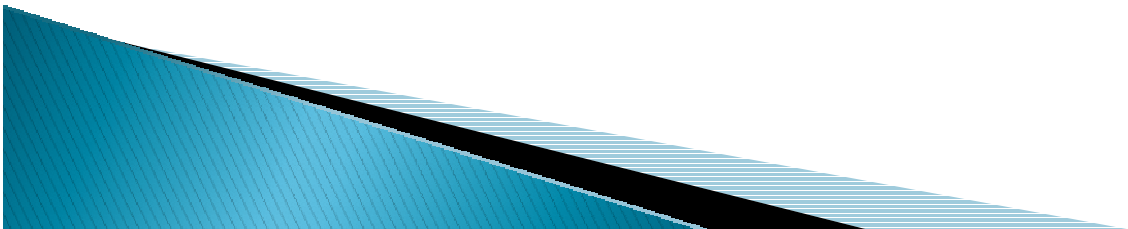
Ferro Alloys

- ▶ Ferro alloy capacity is concentrated largely in the East and West with a modest representation in the South and low in the North.
- ▶ The four regions –East, West, South and North – respectively account for 62%, 22%, 14% and 1% of the total ferro alloy capacity in the country.
- ▶ The top 5 states with maximum concentration of capacity include Orissa (1.58 mt), West Bengal (1.08 mt), Chhattisgarh (0.7 mt), Andhra Pradesh (0.56 mt) and Jharkhand (0.22 mt) and together, they account for 86% of total capacity in the country.



Ferro Alloys

- ▶ Ferro Alloys consist of two categories:
- ▶ (1) Bulk Ferro Alloys viz., High Carbon Ferro Manganese, Silico Manganese, Ferro Silicon, High Carbon Ferro Chrome etc., and
- ▶ (2) Noble Ferro Alloys viz., Ferro Molybdenum, Ferro Vanadium, Ferro Tungsten, Ferro Silico Magnesium, Ferro Titanium, Ferro Boron, etc., manufactured through Alumino Thermic process and used in the production of steel, as deoxidants, desulphurisers and alloying agents.
- ▶ The majority of chrome, Mn and silicon ferro alloys are used in steel making for deoxidisation and to impart particular physical properties in finished steel products, with the result, steel production is main drive for demand of these ferro alloys.



Ferro Alloys

► Capacity and Production:

Capacity addition after liberalization as on date is estimated around 2,300 MVA. With the result, the transformer capacity has increased to around 2,900 MVA and by tonnage it has crossed 5.15 million tonnes capacity in 2010–11. The break-up of the same is given hereunder:

In Million tonnes

Item	Capacity	Production during 2010–11 ((P)	Capacity Utilistion (%)
Manganese Alloys	3.16	1.70	54
Chromium Alloys	1.69	1.04	62
Ferro Silicon	0.25	0.12	48
Noble Alloys	0.05	0.03	60
Total	5.15	2.89	56

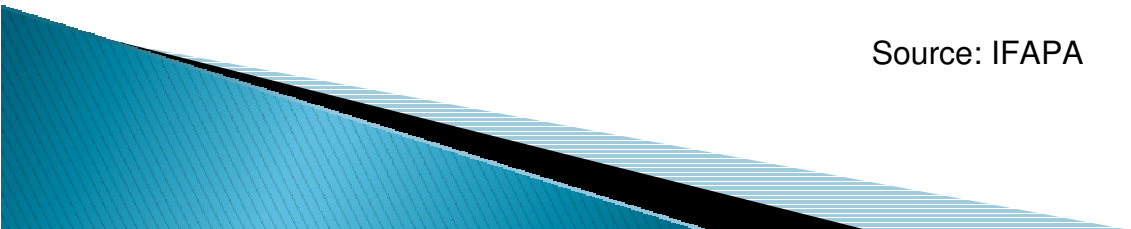
Source: IFAPA; (P) Provisional

Ferro Alloys

State-wise Distribution of Ferro Manganese – Production	
State	% Share
Madhya Pradesh	3
West Bengal	38
Chhatisgarh	14
Orissa	23
Maharashtra	20
Rest	2

State-wise Distribution of Silico Manganese – Production	
State	% Share
Andhra Pradesh	10
West Bengal	34
Chhatisgarh	22
Orissa	11
Maharashtra	8
Rest	15

Source: IFAPA

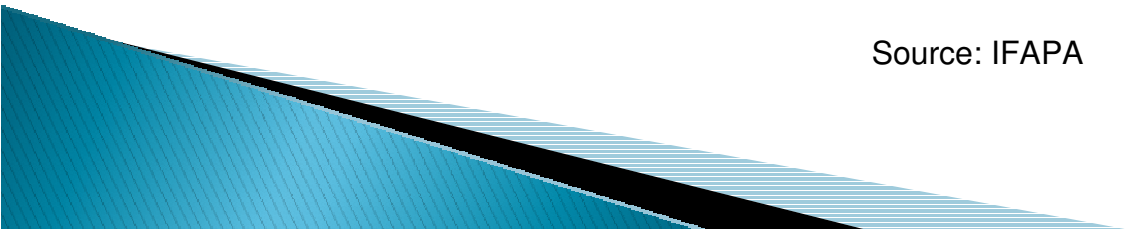


Ferro Alloys

State-wise Distribution of Ferro Silicon – Production	
State	% Share
Sikkim	6
Arunachal Pradesh	7
Andhra Pradesh	14
Pondicherry	10
Meghalaya	50
Rest	13

State-wise Distribution of Noble Ferro Alloys – Production	
State	% Share
West Bengal	4
Jharkhand	7
Gujarat	11
Maharashtra	36
Pondicherry	25
Rest	17

Source: IFAPA

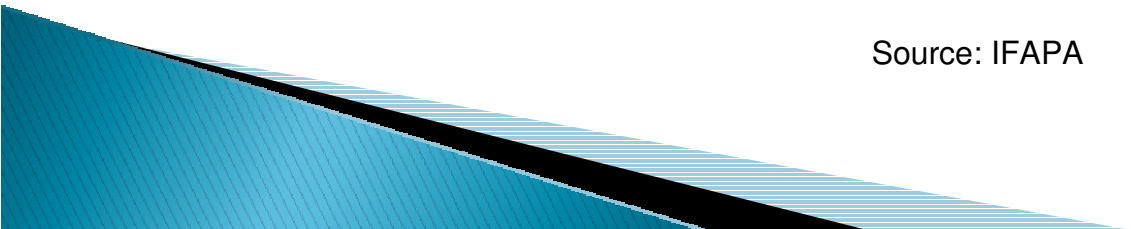


Ferro Alloys

State-wise Distribution of Units – Ferro Alloys	
State	% Share
West Bengal	18
Chhatisgarh	16
Maharashtra	13
Odisha	12
Andhra Pradesh	9
Rest	32

State-wise Distribution of Capacity – Ferro Alloys	
State	% Share
Odisha	33
West Bengal	22
Chhatisgarh	14
Andhra Pradesh	12
Jharkhand	4
Rest	15

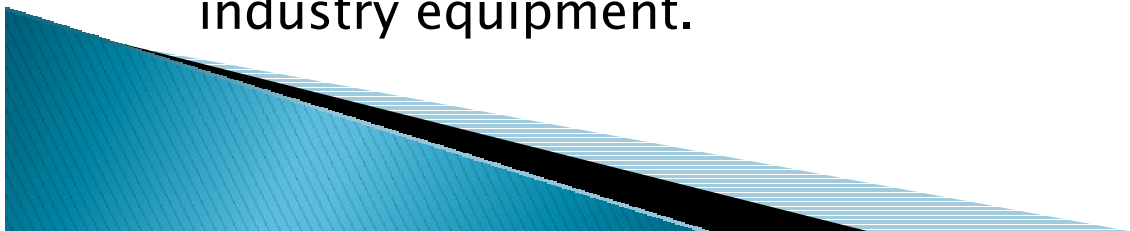
Source: IFAPA



Conclusions & Recommendations

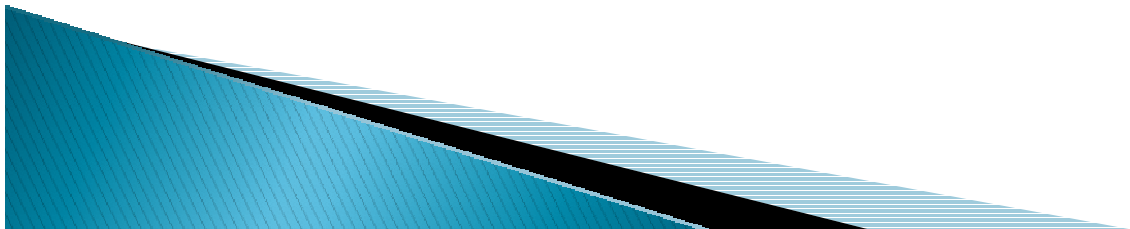
FERRO ALLOYS:

- ❑ Ferro-alloys involve a power intensive industry and there is a strong need to ensure steady power supplies to the industry at a stable price. In the absence of competitively available electrical power, the domestic industry will face stiff competition from imports leading to possible closure or underutilization of the capacity in the industry.
- ❑ The ferro-alloys industry should focus on captive power generation and use nonconventional sources of energy. The Industry should be allowed to have a higher rate of depreciation (30 %) for its captive power plants. This would provide the necessary fiscal support and enhance the attractiveness of the project.
- ❑ To encourage captive power generating capacity, the ferro – alloys industry may be allowed duty free imports of used power industry equipment.



Conclusions & Recommendations

- ❑ There is scope to implement the scheme of utilizing more and more agglomerated feed in the manufacture of chrome and manganese ferro alloys. Since pellets have an advantage over briquettes, pelletization process has to be eventually followed by the Indian plants to reduce their costs by bringing down the specific power consumption. There is need for suppliers to offer lower cost smaller capacity pelletization plants, considering the existing small and medium size furnaces in use.
- ❑ There is a need for government sponsored research in collaboration with industry in beneficiation of low grade manganese ores of eastern India with high Fe content.
- ❑ The government may also consider allocating coal blocks on captive basis to power plants attached to ferro-alloys producing units.



THANK YOU

