

# Threshold Value for Iron Ores Existing v Proposed

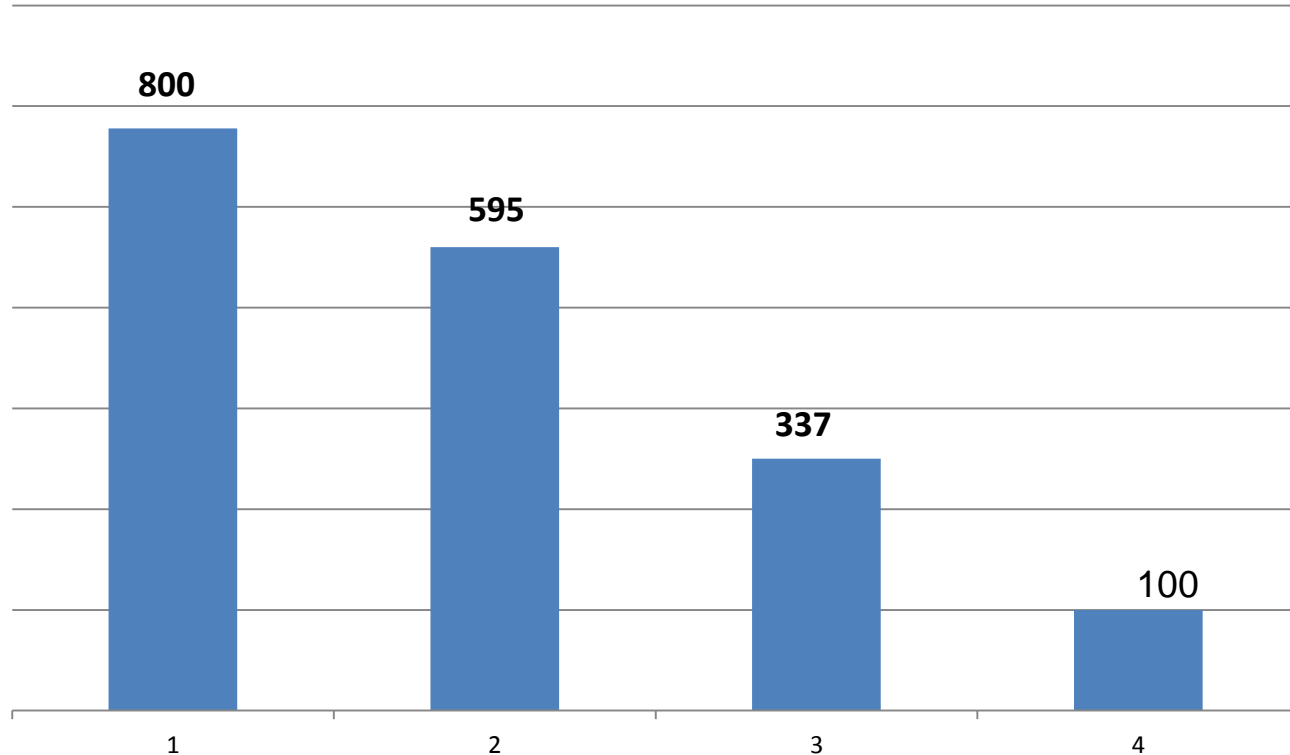
&  
Related Issues

July 21 , 2017

## Points

- ❖ Goan Iron Ores - Historical aspects – Statistical Analysis
- ❖ Threshold Value & Saleable Ores etc - Markets – Past /Current- Needs

# Concessions/Leases in Goa



1

2

3

4

1987

2007

*Operational in  
2011-12*

Sq. Km.

578

460

250

~90

% of total  
Goa area

16%

12.5%

6.7%

~2.5%

## Presently

89 Leases Renewed & ~ 12 leases extended upto 31-3-2020.

Current Production – Limited !

## Concerns

- Mining Lease area in Goa are limited - Max area for a lease is 100 hac
- Ore : Overburden ratio is 1: 2.5 ~ 3
- DOML has certain legal provisions which need further clarity
- Inventory space within Mines would get suppressed if quantum beyond market requirements need have to be stacked.
- Seasonal Operations ( 9M , 9H)
- *Markets ? Prices ? Challenges & Solutions w.r.t. proposed TLV ?*

## Characteristics of Goan Ores

- Goan ores are of inferior grades as compared to ores from rest of the country.
- State's Industrial policy discourages setting up of steel plants. Even existing Pig Iron / Sponge Iron Plants, in Goa, source their ores primarily from adjoining States.
- Due to high inland logistics costs, and inferior grades, Goan ores have limited scope of being utilized in steel plants based in other states.

Particulars	Goan Ores	Non Goan Ores
Grades	~46% – 59% Fe	~> 60% Fe
Moisture	10%+	~ 5~6%
Al <sub>2</sub> O <sub>3</sub> +SiO <sub>2</sub>	~ 9 – 10%+	Max 6%
Classification	Mostly Fines	Mostly Lumps

- Value addition in Goa, through beneficiation, had been initiated since 1960's and continues with enhanced R&D.
- Goan ores being largely haematitic have limited scope for up-gradation, ( *as compared to magnetitic ores* )

Goan ores, therefore, can be used in the blast furnaces only by blending with high grade – low gangue ores.

Hence, exports has been limited option available

**1990 ( TLV )**

Iron Ore

A) Goa Iron ores

(i) Silicious Ores - 40% Fe

(ii) Hematitic Ores – 55% Fe

( Both Lumpy and Powdery Ores )

B) Bellary Hospet Region - 58% ( Provisional )

**16<sup>th</sup> October 2009 ( TLV)**

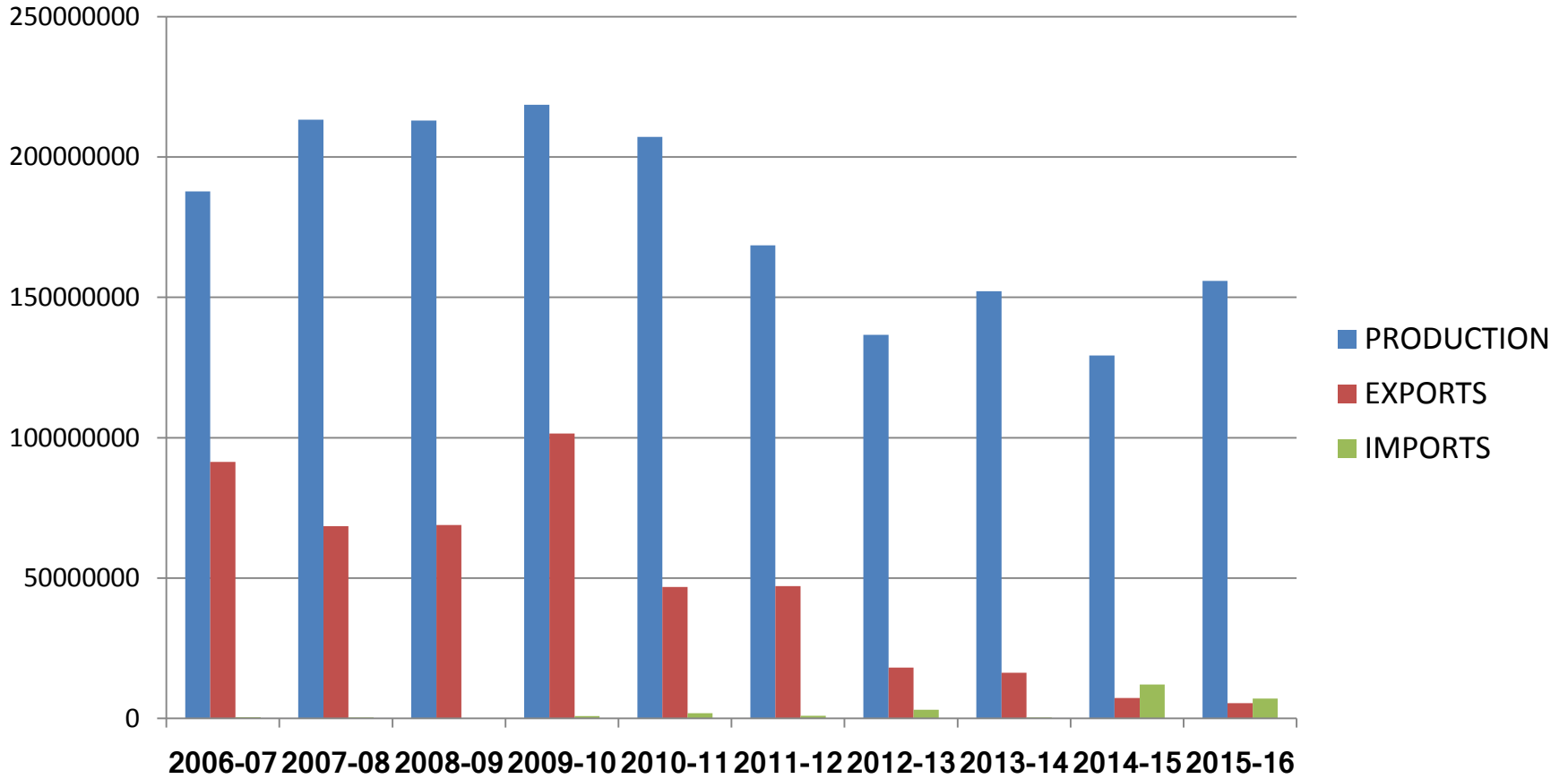
Iron Ore

(i) Hematitic Iron Ores – 45% Fe

(ii) Hematitic Siliceous Ore ( Ore of Goan Origin) : 35%Fe

# Iron Ore Production, Exports & Imports – *Indian perspective*

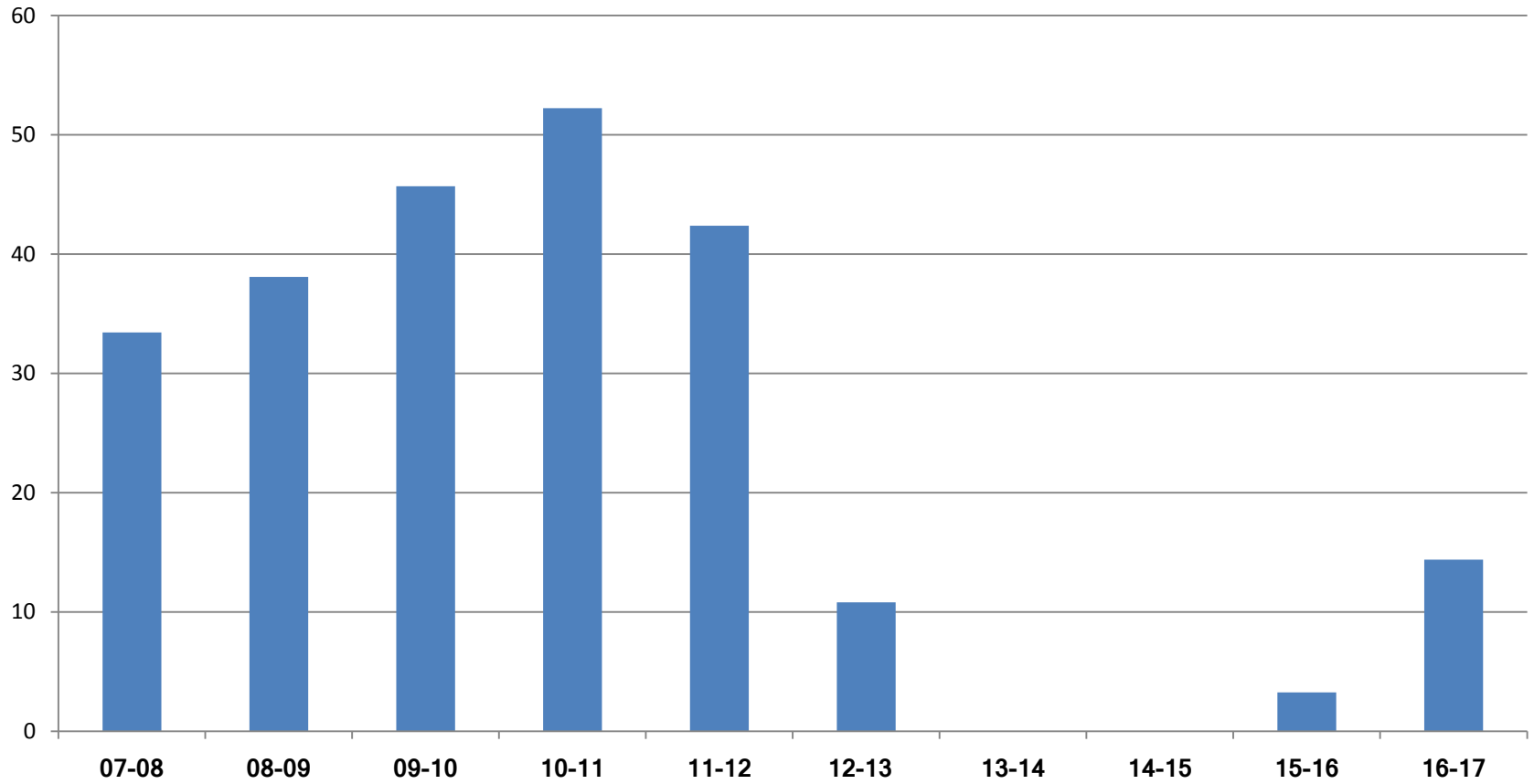
( MTons)



Source : IBM

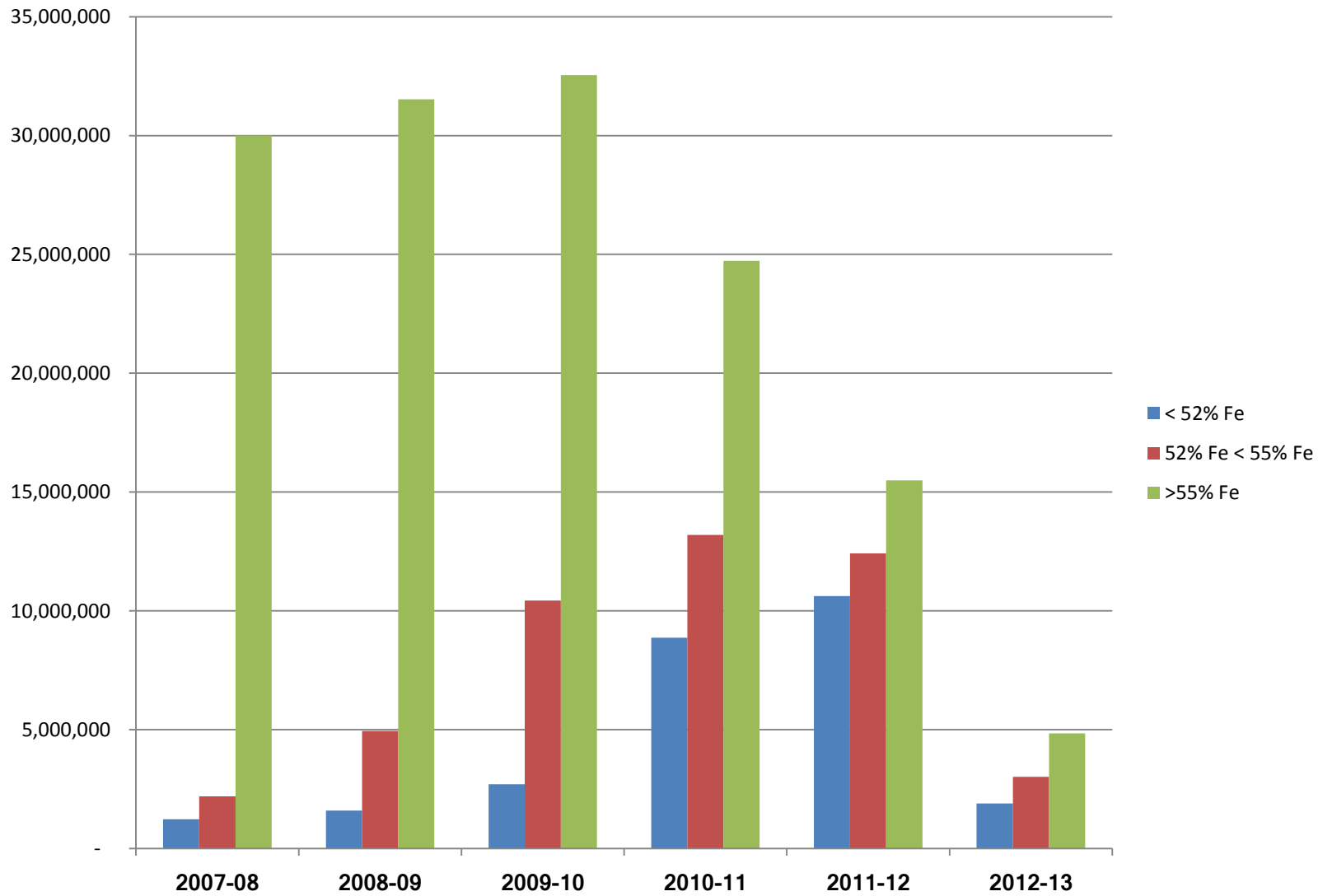
# IRON ORE EXPORTS FROM GOA

In Mtons

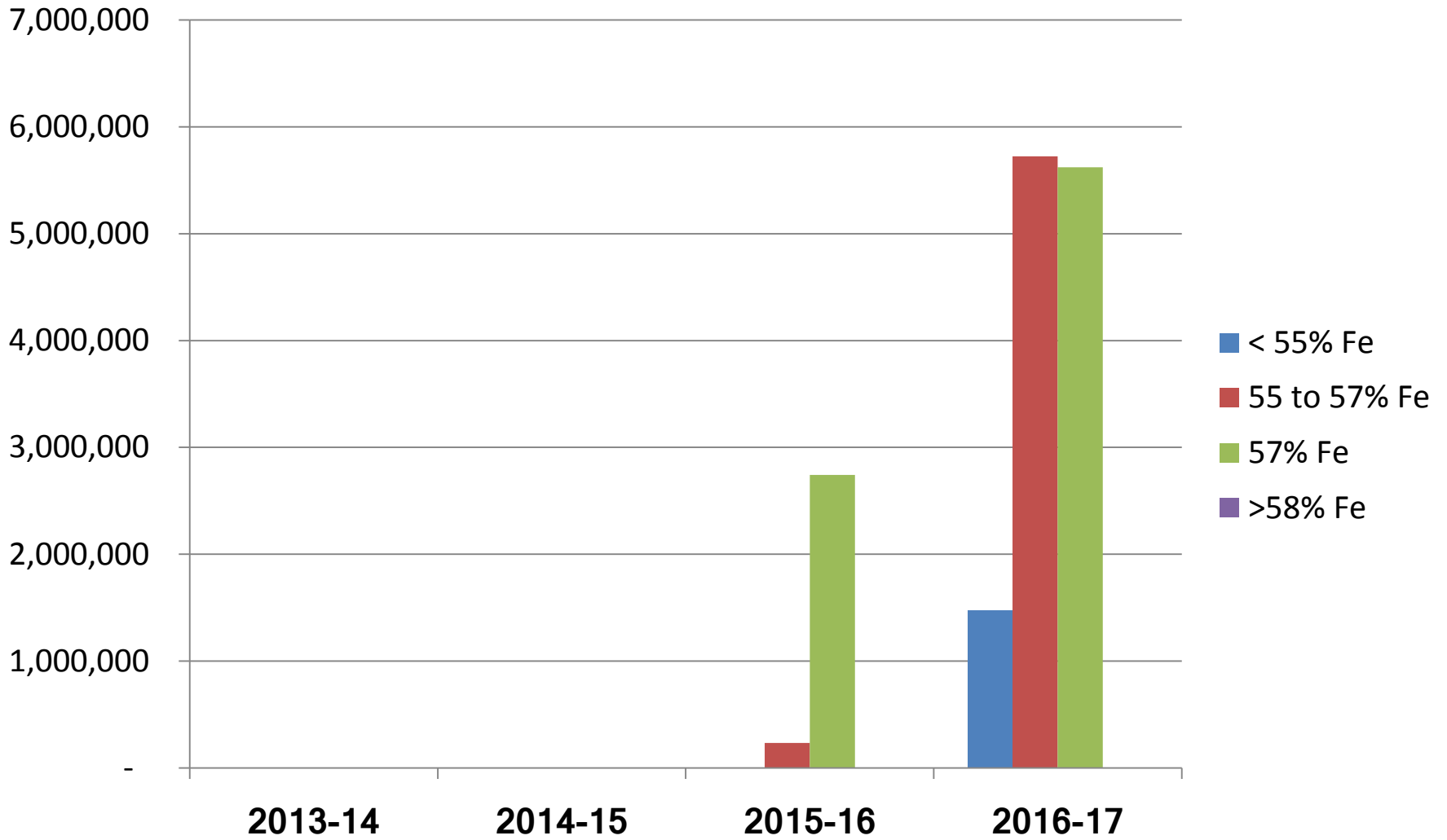




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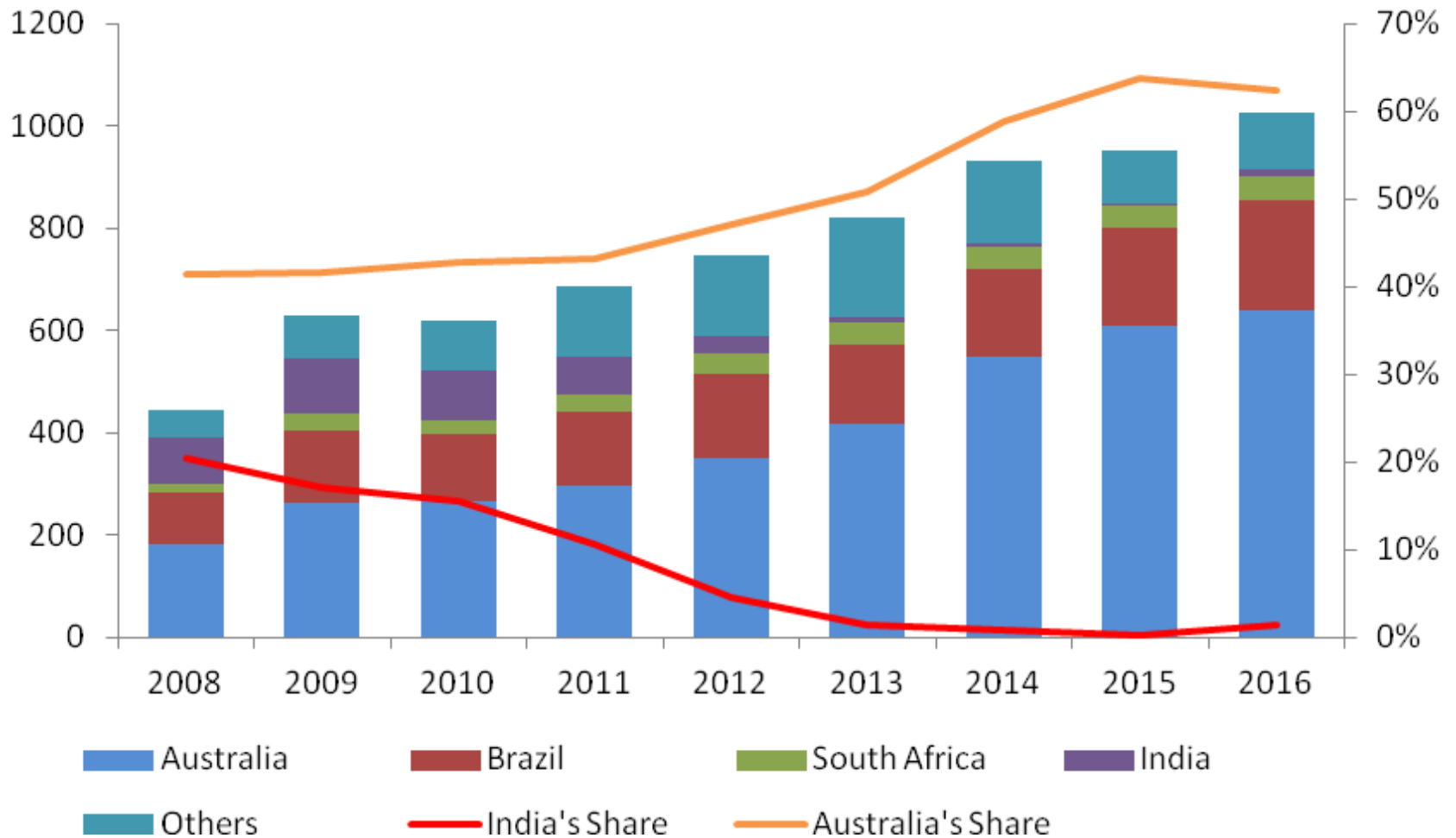
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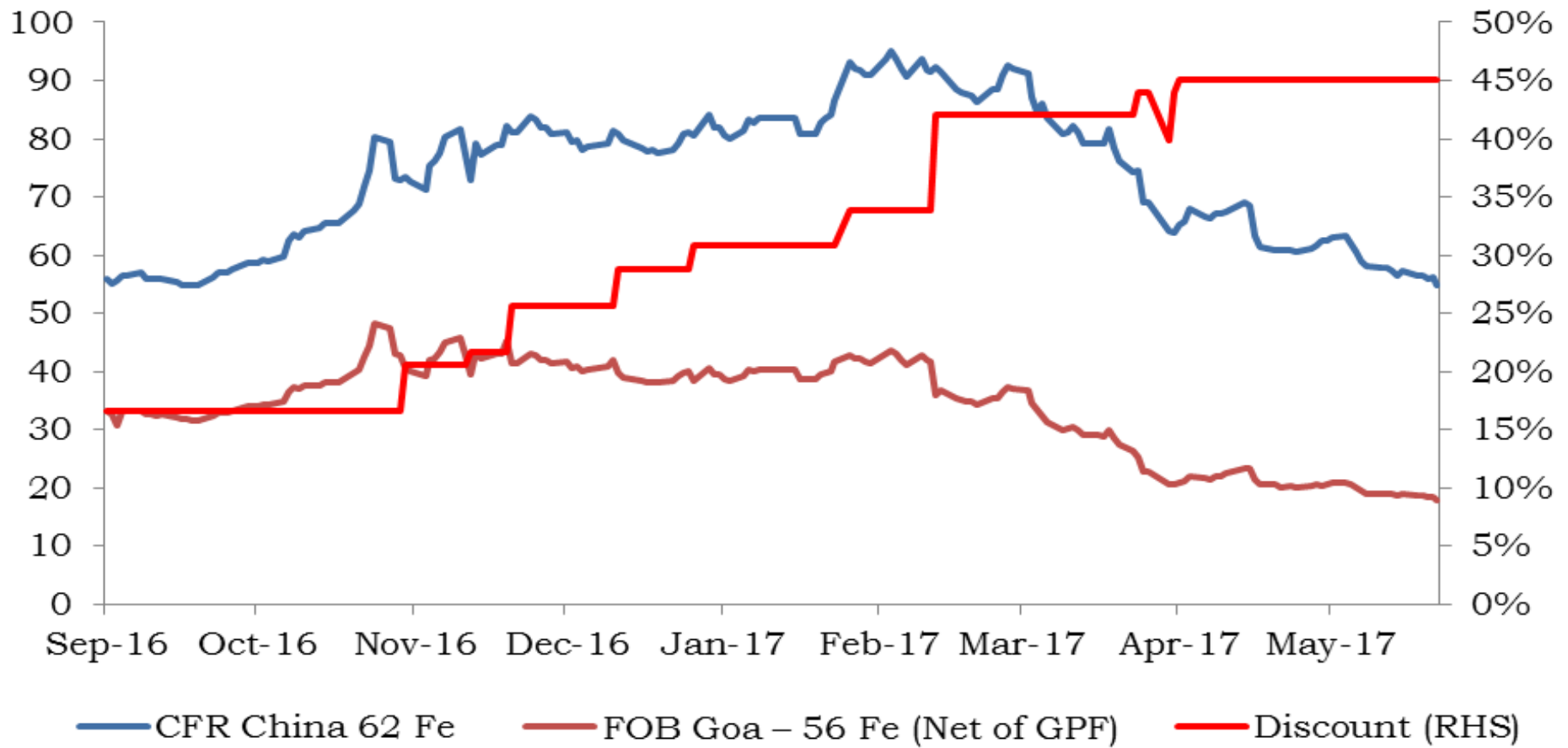
# REALITY TODAY



- Iron Ore Prices are falling .....Markets grim.
- High Coking Coal Prices



1. *India loosing market whereas Australia is gaining.....*
2. *Buyers are seeking higher grade ores .*
3. *Higher Alumina Content in ores of Goan origin is another disincentive*
4. *Higher Tax incidence*



Presently, with Grades below 55% Fe, Mining has become unviable

In Goa, ore extracted from the mines are generally segregated as per the material characteristics and its association with gangue minerals.

The segregation of ores is as follows :

- Normal ore (Fe 54% and above)
- Sub-grade ores (Fe 45 to 54%!) )
- Siliceous ores (Fe 35 to 48%)
- Magnetite ores (Fe 35 to 48%)

## NORMAL ORES

<b>Normal ore( 54 % Fe&amp; above)</b>		
	<b>AVG.GOA</b>	
	<b>Wt.%</b>	<b>Fe%</b>
Feed	100	56.51
Calibrated Lumps	17.92	59.20
Washed Fines ( Concentrate)	57.07	60.58
Total Product	74.99	60.25
Tailings	<b>25.01</b>	45.30

*Typical Illustration after wet process*

## SUB GRADE ORES

Sub grade ore(45 to 53% Fe)		
	AVG.GOA	
	Wt%	Fe%
Feed	100	49.62
Calibrated Lumps	18.5	53.07
Washed Fines(concentrate)	48.7	53.75
Total Product	67.2	53.56
Tailings	32.8	41.55

*Typical Illustration after wet process*



## SILICIOUS ORES

<b>Siliceous ore( 35 to 48 % Fe)</b>		
	<b>AVG.GOA</b>	
	<b>Wt%</b>	<b>Fe%</b>
Feed	100	44.12
Calibrated lumps	16	52.06
Washed Fines(concentrate)	47.20	54.55
Total Product	63.2	53.92
Tailings	36.8	27.28

*Typical Illustration after wet process*

## MAGNETIC ORES

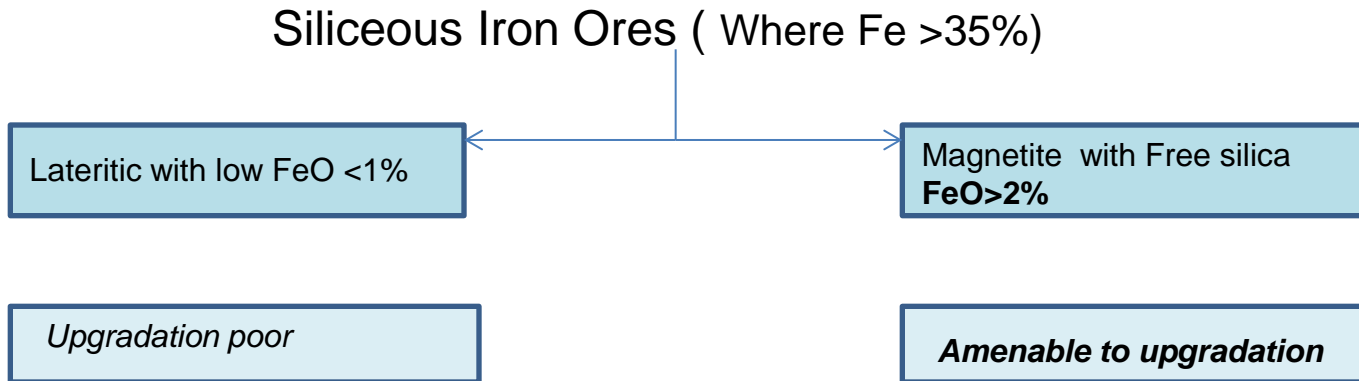
<b>Magnetite /martatised ore( 35 to 48 % Fe)</b>		
	<b>AVG.GOA</b>	
	<b>Wt%</b>	<b>Fe%</b>
Feed	100	44.48
Calibrated lumps	10.28	54.56
Washed Fines(concentrate)	54.57	57.49
Total Product	64.85	57.03
Tailings	35.15	21.33

*Typical Illustration after wet process*

## INFERENCES

- ❖ Using Beneficiation processes, upgrade in Fe unit would be in the range of 2-4 Units of Fe at Max for Haematitic Ores.
- ❖ Tailing Loss 25% ~ 30% for Subgrade ores
- ❖ Reduce effective production ( Environmental Clearance loss)
- ❖ Leases areas are limited. No Demand for Ores < 55% Fe presently
- ❖ Subgrade material below 50% Fe will increase inventory space within limited lease areas ( *especially when DOML has certain legal considerations* )
- ❖ **Recommendation**
  - TLV should be **raised to 50% Fe** for Haematitic Ores

# Siliceous Iron Ores



## Recommendation

*TLV for Siliceous Ores with Magnetite may be retained at 35% Fe But be qualified with a minimum of 1.5%FeO*

*A VP should be indicated upto TLV limits*

**THANK YOU**

