



BHP Billiton Manganese

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GM TEMCO
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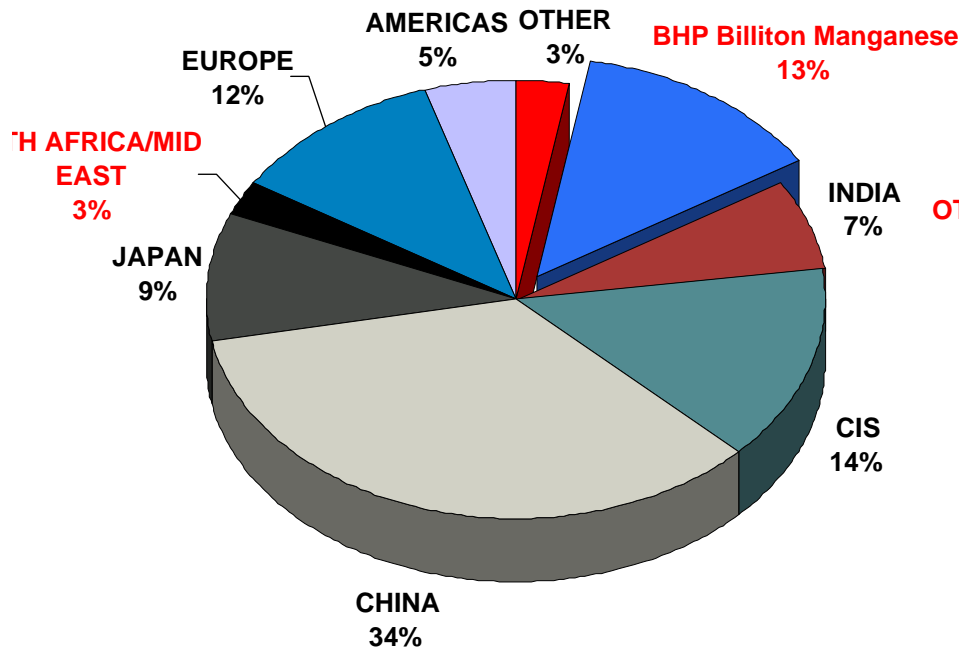
BHP Billiton Manganese Operations



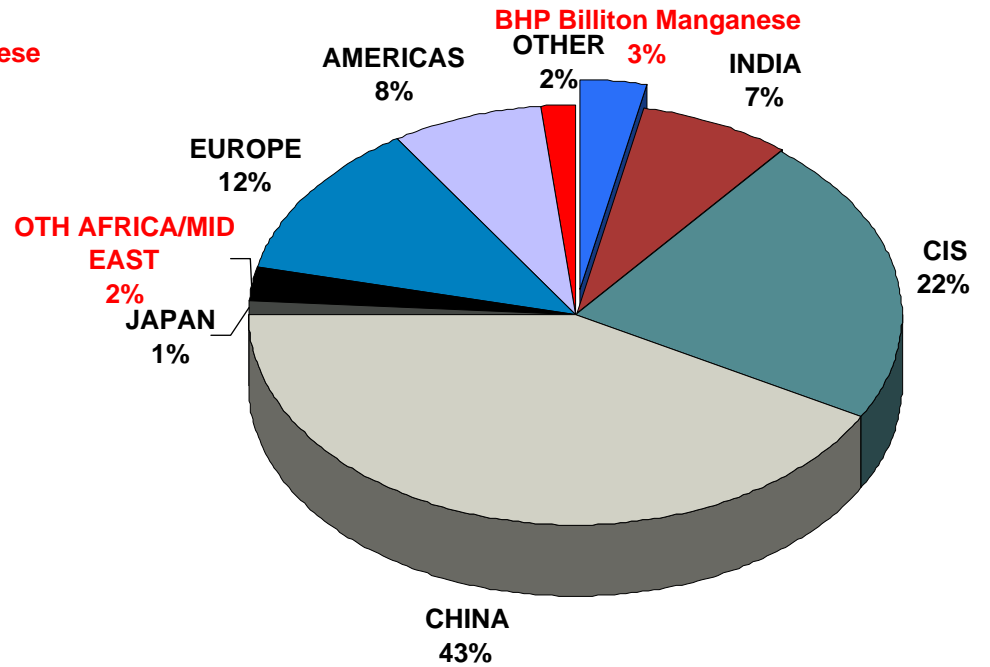


Manganese Alloy Market Share – estimate only

HCFeMn



SiMn





BHP Billiton Temco



BHP Billiton TEMCO





Low Head

Georgetown

Pointer 41°06'04.03" S 146°50'32.71" E elev 22 m

Streaming ||||| 100%

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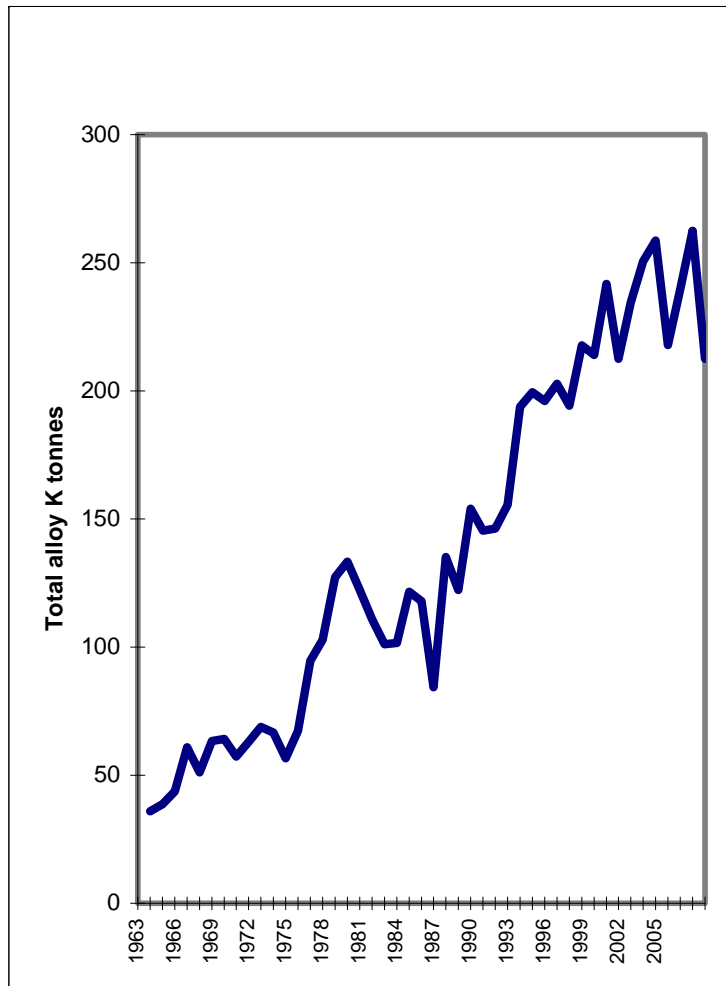
Eye alt 12.53 km

TEMCO History

- **BHP established Tasmanian Electro Metallurgical Co. (TEMCO) in 1960**
- **Commissioned Furnace 1 in 1962 to produce 37500tpa**
- **Manganese ores imported from South Africa**
- **Ore supply from GEMCO in 1966**
- **Several capacity upgrades to current production of 330,000tpa FeMn**
- **Purchased by Billiton/AAC in 1998**
- **Billiton and BHP merger - 2001**

Continuously improving efficiency and throughput

Temco Alloy Volume (Kt SiMn +Kt FeMn)



Temco Operating History

- 1962 Furnace 1
- 1966 Furnace 2
- 1976 Furnace 3 5
- 1976 Sinter plant
- 1987 Capacity increase F12&3
- 1987 Energy recovery Plant
- 1993 Furnace 5 FeSi to SiMn
- 1997 Furnace 3 Capacity increase
- 2001 Furnace 1 Freeze Lining (All furnaces 2009)
- 2009 Furnace 5 Capacity increase

TEMCO Products

Ferromanganese (FeMn)

- 130,000 tonnes 76% FeMn
- 30% Mn rich Slag for SiMn production
 - Raw Materials : manganese sinter, manganese ore, iron ore, coal, coke and limestone



Silicomanganese (SiMn)

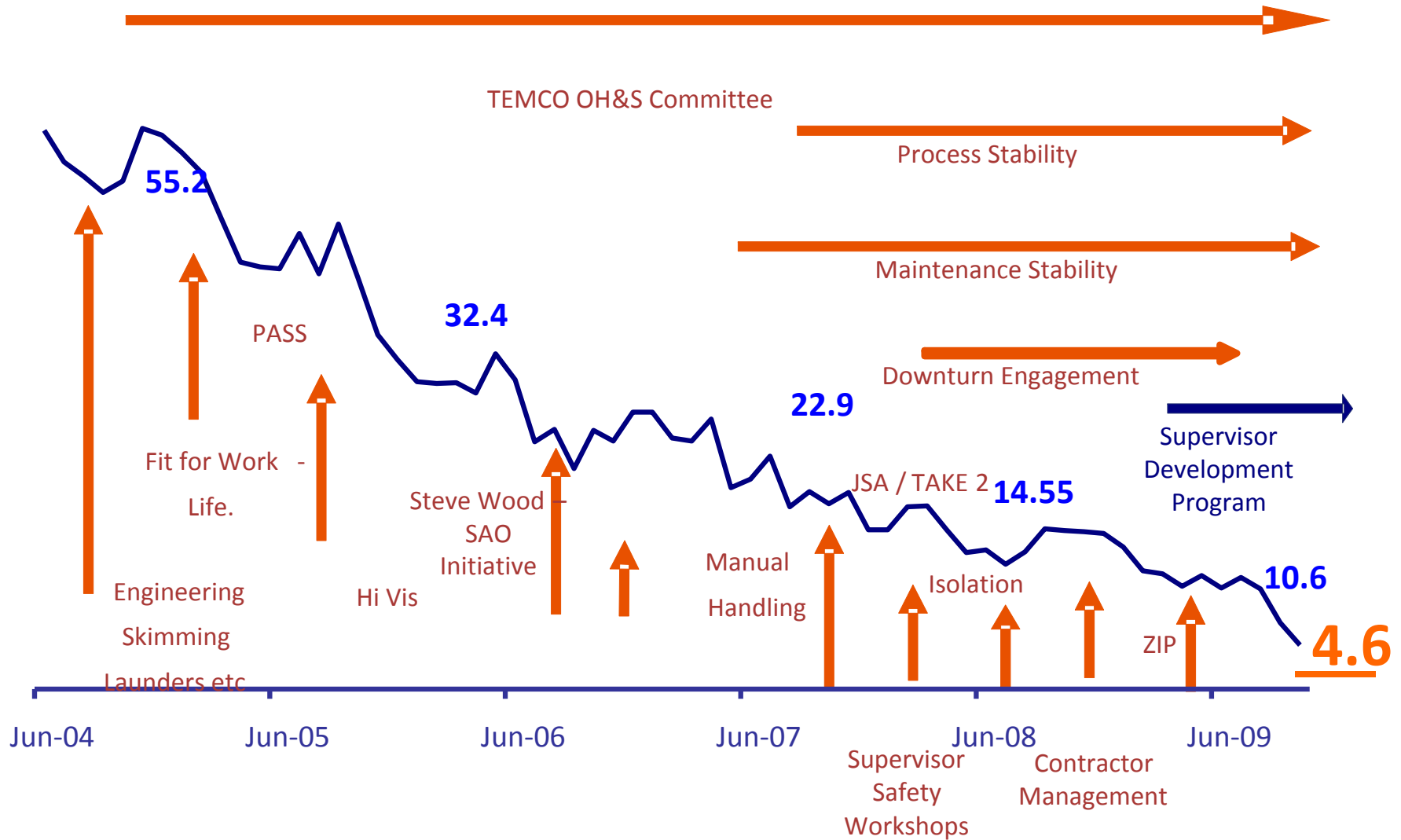
- 120,000 tonnes 66%Mn 16% Si
 - Raw Materials: ferromanganese slag, quartzite, manganese sinter, manganese ore, coal, coke and dolomite



Manganese Sinter

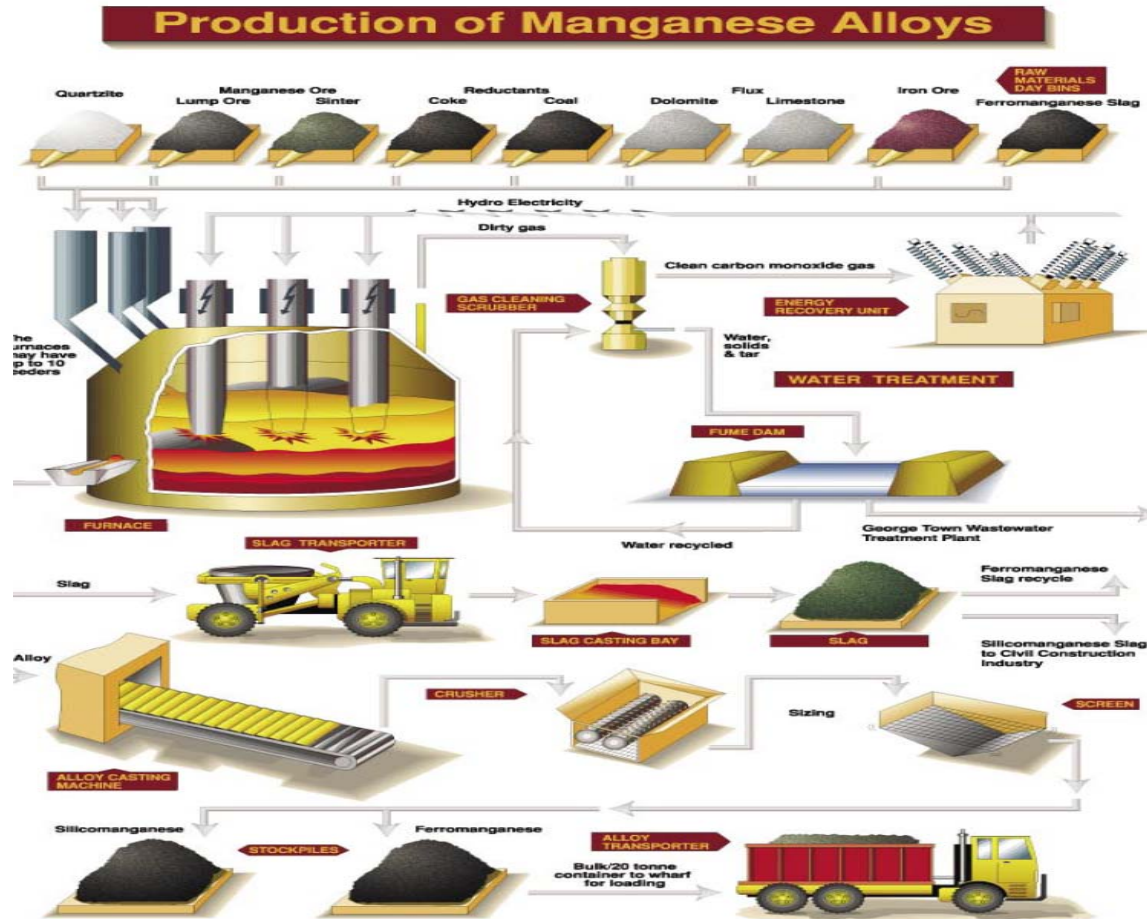
- 350,000 tonnes capacity 55% Mn
- 70% consumed in TEMCO furnaces
 - Raw Materials : manganese ore fines, coke breeze

Continuing to reduce injuries



Process description

TEMCO



Furnace 5

Furnace 5 has produced FeSi and SiMn

▪ Key features

- 3x17 MVA semi closed furnace
- FeSi to SiMn in 1993
- Baghouse dust collection
- Removable skimmer
- Ladles
- Freeze Lining



Furnace 5 semi closed

Furnace 3

Furnace 3 has increased capacity with reduced costs

■ Key features

- Production of SiMn and HC FeMn
- Elkem 54 MVA closed furnace
- Venturi gas scrubbing
- Fce gas to energy recovery unit
- Casting machine
- Freeze lining



Furnace 3 Tapping

Furnace 1&2

Furnace 1&2 provide product flexibility

■ Key features

- SiMn & FeMn Production
- Elkem 36 & 33 MVA closed
- One building
- Venturi gas scrubbing
- Modular electrodes
- Freeze lining



Casting machine

Sinter Plant

Sinter plant adding value to GEMCO fines

■ Sinter Plant

- Lurgi 36m² on strand cooling
- Kawasaki line burner
- Continuous strand operations
- 350,000t capacity
- Internal consumption 200Kt



Sinter strand

Power Generation

Efficient energy recovery from furnace off gas

- 12 MW Power plant
 - 50% CO gas from F12&3
 - Steam Boiler
 - Siemens turbine and alternator
 - Commissioned 1987

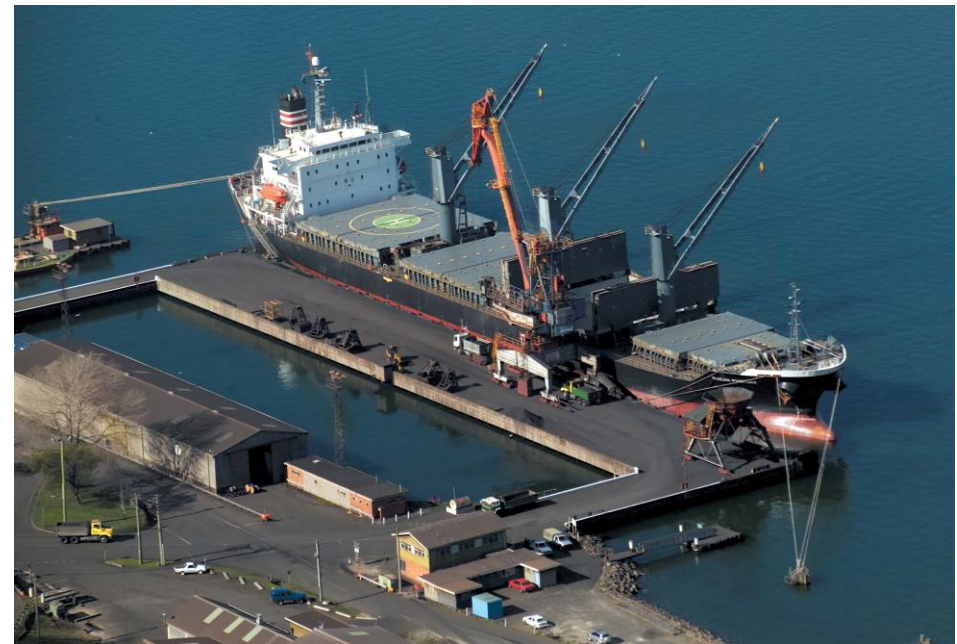


Power Plant

Port Operation

Control raw materials unloading and alloy dispatch

- Wharf Operation
 - TEMCO operated
 - 45 Kt ore shipment
 - Alloy skip for back loading



Wharf Crane

Continued Investment into our assets

Year of Upgrade or Commissioning (Calendar Year)									
Furnace	1962	1966	1976	1987	1993	1997	2001	2007	2009
1 FeMn/SiMn	13.2MVA	16MVA		27MVA			36MVA Freeze Lining		
2 FeMn/SiMn		16MVA		29MVA		33MVA			Freeze Lining
3 FeMn/SiMn			27MVA	36MVA		54MVA		Freeze Lining	
5 FeSi/SiMn			45MVA FeSi		45MVA SiMn			51MVA	54 MVA Freeze Lining
Sinter Plant			Sinter Plant 600t/day		800t/day				1000t/day

Summary

- Significant Alloy Smelter on world scale
- 47 years of operating history
- World competitive smelter through:
 - Integration with Mn Mines
 - Highly skilled workforce
 - High quality assets

