Hot Rolled Products
Analyst Site Visit
Port Kembla

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Originally issued by BHP Steel. On 17 November 2003 BHP Steel became BlueScope Steel Limited.
Port Kembla Steelworks
Overview

• Fully integrated plant with steel making capacity of 5.1mtpa. Optimal unit size.

• Situated on 800 hectares and employing 3800 people.

• Amongst world’s most technically advanced, low cost producers of quality carbon steel products.

• Technical and operational skills and experience.

• Initiatives:
  - reducing cost of poor quality
  - supply chain velocity
  - ongoing process improvements
  - ongoing cost savings
  - PCI
Coke Ovens 2.4Mtpa

2 Blast Furnaces 5.1 Mtpa

Sinter Plant 5Mtpa

Basic Oxygen Steelmaking 5.1 Mtpa

3 Continuous Slab Casters 5.1 Mtpa

Hot Strip Mill 2.4Mtpa

Plate Mill 0.3Mtpa

Cold Mill 0.5Mtpa

Hot Rolled Coil to Coated Products Springhill & Export Markets

Cold Roll Coil to Packaging Products

Plate to domestic & export customers

Slabs to Coated Products Western Port and to export

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Product Flow

Port Kembla Steelworks 5.1mt slab p.a.

- Castrip
  - BHP Steel
  - Nucor
  - IHI

- Export Slab 21%
- Hot Strip Mill 49%
- Plate Mill 7%

- Export 16%
- Packaging Products 21%
- Other Domestic 26%

- Coated Steel Australia (Western Port) 23%
- Coated Steel Australia (Springhill) 37%

North Star BHP Steel 1.62mt HRCpa
Blast Furnace – Iron Making Process

Coke and gases burn to create temperatures up to 2200°C; iron melts out of the iron ore and reacts with carbon in the coke while limestone (flux) melts also and forms slag.

Molten iron and slag fall to the furnace bottom (hearth) where they are drained out through one of three tapholes into a torpedo ladle.

- Feed:
  - Iron Ore 7.5mtpa
  - Coking Coal 3.0mtpa
  - Limestone

- 2 Blast Furnaces

Hot air and gas is fed into the blast furnace through the tuyeres

Raw materials (iron ore, coal [coke] and limestone are fed into the top of the blast furnace

Molten slag to by-products processing

Torpedo car – iron to BOS
Steelmaking Process

- Scrap steel (approx. 40t)
- Molten iron (250t)
- Refractory lined BOS furnaces (3 x 280t)

Basic Oxygen Steelmaking (BOS)
5.1Mtpa

Oxygen blowing
Slab Making Process

Continuous Slab Casters
5.1 Mtpa
Max. width = 2200mm
Max. length = 12.5m
Max. thickness = 300mm

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HRC Process

Hot Strip Mill
Commissioned 1955, upgrades 1972 & 1985
2.4 Mtpa

Slabs ex Slab Casters
480tph @ 1225°C

Product flow

Roughing-Reversing Mill
300mm – 25mm

Coil box

Six Stand Finishing Mill
min. gauge 1.48mm
Plate Process

0.31 Mtpa
Commissioned 1963
5mm-180mm thick x
1200mm-3400mm wide

Shearing, stencilling, shot blasting, prime painting & inspection

Product flow

Slabs ex Slab Caster
Reheat Furnaces
Low Cost Producer

- Is one of the 10 lowest cost Hot Rolled Coil producers in the world with global scale
- Improvements continue to retain this position

Source: D. Barnett and BHP Steel
Port Kembla Steelworks Productivity

Employees (Port Kembla Steelworks)

Productivity (Tonnes per person per year)
Port Kembla Steelworks Lost Time Injury Frequency Rate

Lost time injuries per one million hours worked (contractors & employees)

- 95/96: Data not available
- 96/97: 4.7
- 97/98: 2.7
- 98/99: 3.5
- 99/00: 2.5
- 00/01: 2.4
- 01/02: 1.5
- 02/03 as @ end Dec 02

Lost time injuries per one million hours worked (contractors & employees)
2002 Total Revenue By Product (Indicative)

### Revenue by Product (%)
- Slab: 40%
- HRC: 50%
- Plate: 10%

### Revenue by Region (%)
- Australia: 70%
- ROW: 20%
- Americas: 10%
## Significant Capital Expenditure

<table>
<thead>
<tr>
<th>Commissioning Date</th>
<th>Project</th>
<th>Capex (A$m)</th>
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<tbody>
<tr>
<td>1992 – 1996</td>
<td>No.6 Blast Furnace</td>
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<td>1995 – 2000</td>
<td>5 Mtpa Project</td>
<td>91</td>
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<tr>
<td>1996 – 2000</td>
<td>Coke Side Emission Control</td>
<td>90</td>
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<tr>
<td>2001 – 2003</td>
<td>Sinter Plant Emission</td>
<td>94</td>
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North Star BHP Steel
Overview

- 50:50 joint venture with Cargill Inc.
- Located Delta, Ohio
- 330 employees
- Commissioned 1996
- Two EAF’s / annual capacity 1.62mt
- Producers HRC from scrap metal (sourced locally) and pig iron
- Sales largely regional
- Modern thin (90mm) slab casting technology
Joint venture formed with Nucor in March 2000 to market the technology worldwide.

- Nucor’s Crawfordsville, Indiana plant the first licensee
- The strip caster will ultimately cast both carbon and stainless steel
- Nucor has rights to USA and Brazil
- BHP Steel has rights to South East Asia and Australasia
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Scale Comparison with Current Casting Technologies

Conventional Slab Casting

- 1-2 m/minute Gas cutter
- Rougher
- Cooling
- Reheat furnace
- Finisher
- Run out table cooling
- 200-300 mm thick
- 20-40 metric ton coil
- Cooling
- Reheat furnace
- Rougher
- Gas cutter
- 1-2 m/minute

Thin-Slab Casting

- 4-6 m/minute
- Finisher
- Run out table cooling
- 1-10 mm thick
- 20-40 metric ton coil
- Cooling
- Reheat furnace
- Rougher
- Gas cutter
- 1-2 m/minute

Strip Casting

- 15-150 m/minute
- Scale Control Chamber
- Cooling
- Run out table cooling
- 50-60 mm thick
- 20-40 metric ton coil
- Cooling
- Reheat furnace
- Rougher
- Gas cutter
- 1-2 m/minute

- 60 m
- 1-10 mm thick