



**NORTH STAR
BLUESCOPE
STEEL**



Ohio Steel Plant Energy Audit



Presentation

- Review North Star BlueScope Steel
- Explain how an engineering firm assisted us with energy opportunities through ODOD and DOE funding
 - Assessment
 - Cultural Elements
 - Specific Projects

Company Overview

- North Star BlueScope Steel LLC is a leading North American producer of hot rolled bands located in Delta, OH
- 50/50 joint venture between BlueScope Steel North America Corporation of Kansas City, Missouri and Cargill Incorporated of Minneapolis, Minnesota
- Newly constructed mill between 1995 and 1996, production operations started in early 1997
- Current production capacity of 2.2 million tons per year
- Produced over two million tons of hot rolled bands in each of the last three fiscal years (2006 – 2008)
- For the twelve months ended January 31, 2009, North Star generated sales and EBITDA of \$1,451.8 million and \$237.0 million, respectively

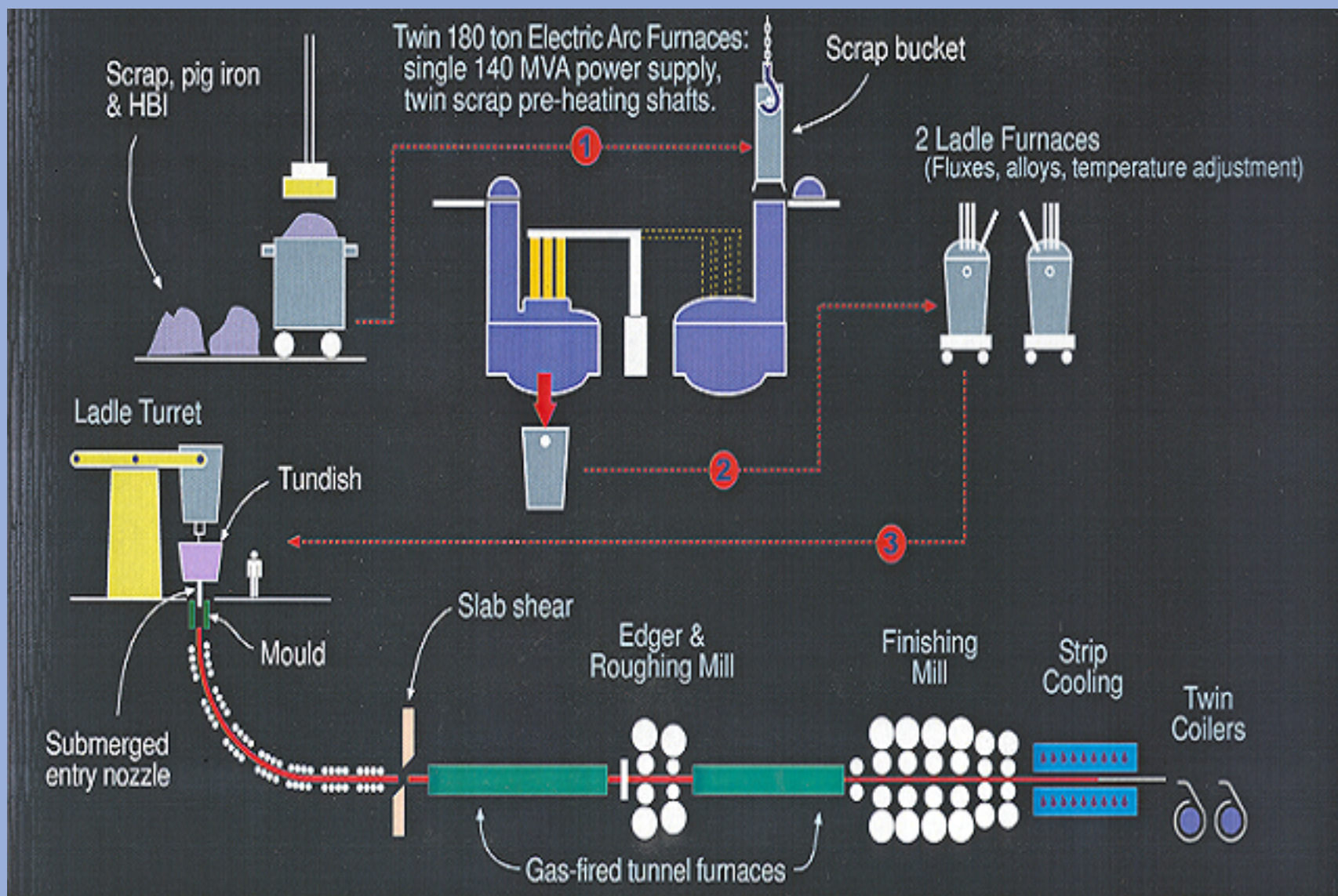
Production Overview



- The Company's production facilities were newly built between 1995 and 1996, making the mill among the newest in North America
 - State of the art equipment includes:
 - Two Fuchs (Germany) Electric Arc Furnaces
 - A Sumitomo (Japan) Caster
 - A Danieli (Italy) Hot Strip Mill
 - Originally built with production capacity of 1.6 million tons per year
 - Since expanded to the current level of 2.2 million tons per year

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Production Process



- Scrap metal, pig iron, and hot briquetted iron delivered to mill via truck or railcar and stored in segregated piles on the scrap storage yard
- Magnet crane on the scrap storage yard picks up these raw materials and transfers them to rail cars which transport the scrap to the processing plant

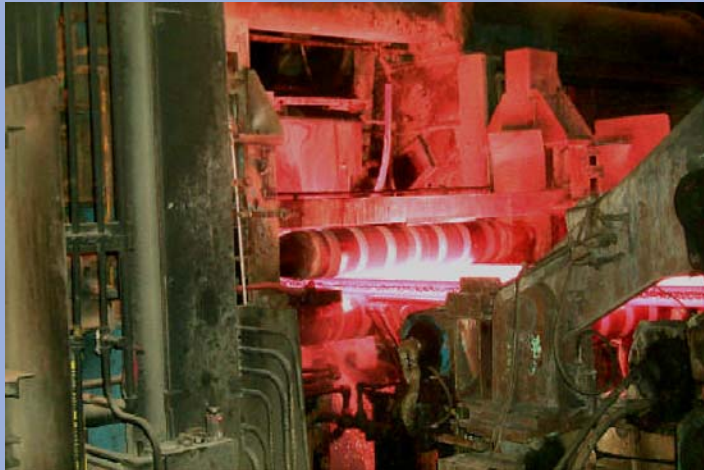


- Scrap is fed into one of the Company's two Fuchs Electric Arc Furnaces, which are heated by charged electrodes to 2,900°F
- The EAFs are capable of melting the scrap into 190 tons of liquid steel every 40 minutes and are lined with brick called refractory that acts as insulation and prevents the melted steel from burning a hole through the EAFs
- Impurities in the scrap float to the top of the EAFs during the melting process and are separated out and processed by Fulton Mill Service as slag for eventual use in concrete or asphalt

Production Process

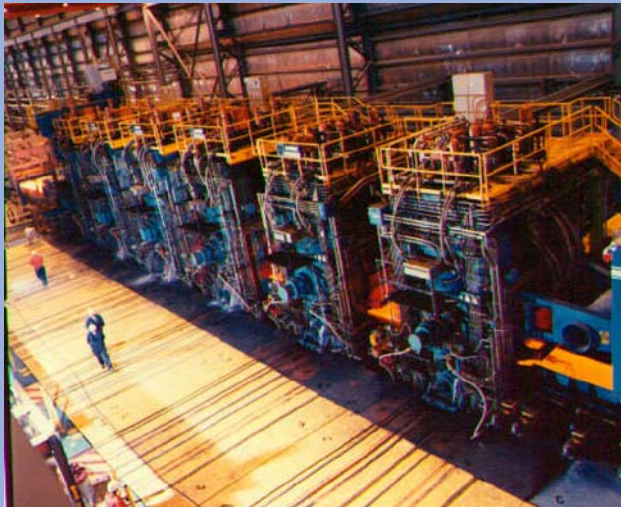


- Melted steel drains from the EAFs into ladles that are transported to the ladle metallurgical furnaces, which are designed to control chemistry, cleanliness and temperature for optimum slab quality and throughput
- Within the ladle metallurgical furnaces, 18” electrodes re-heat the steel while additives, alloys, flux, and wire are added to create various metal grades for customer specifications
- Chemicals mixed into the steel at this point in the process include carbon, boron, aluminum, titanium, and vanadium



- Steel mixture is transferred from the ladle metallurgical furnaces to the Sumitomo slab caster, which molds the steel into rectangular slabs 4” thick and up to 60” wide
- The testing of two chemistry samples taken at the time of casting ensures surface and internal quality

Production Process

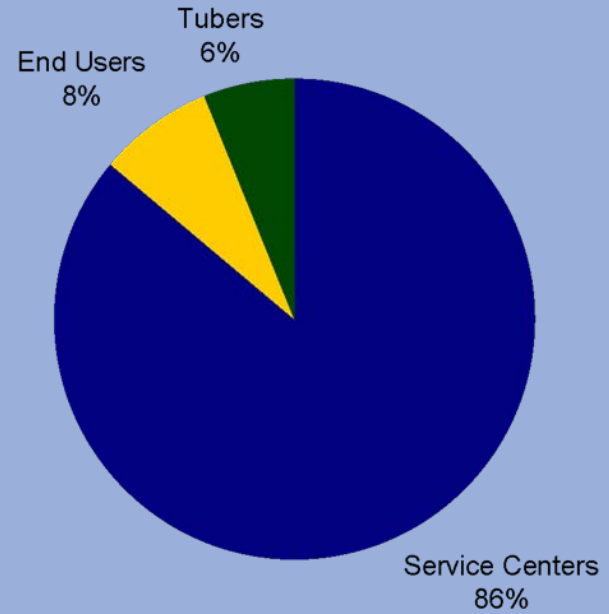
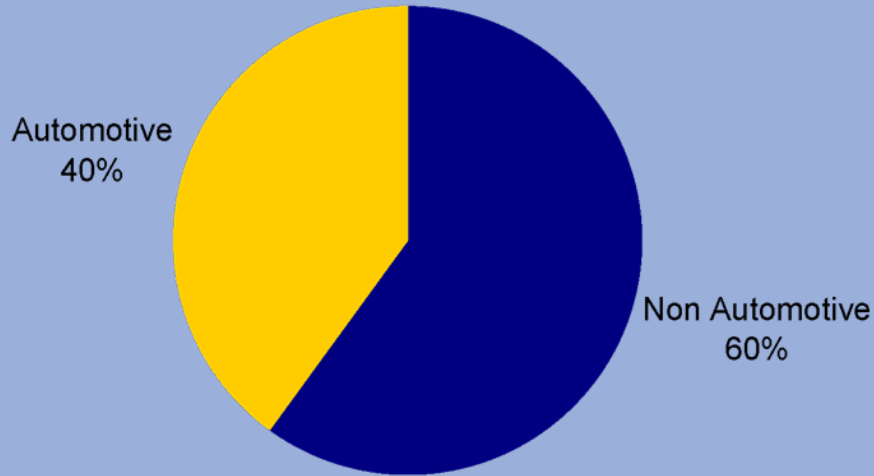


- Steel slabs leave the slab caster and enter the tunnel furnace, which heats the slabs to make them pliable for the Danieli rolling mill
- Rolling mill consists of eight stands, including two roughing stands and six finishing stands. The roughing stands flatten the slabs into longer and thinner slabs, while the finishing stands roll the steel according to customer specifications for gage and width
- Steel strip is cooled on the laminar flow run out table. After cooling, the steel is transferred to the down coilers, which coil the steel into coils and band/stamp them

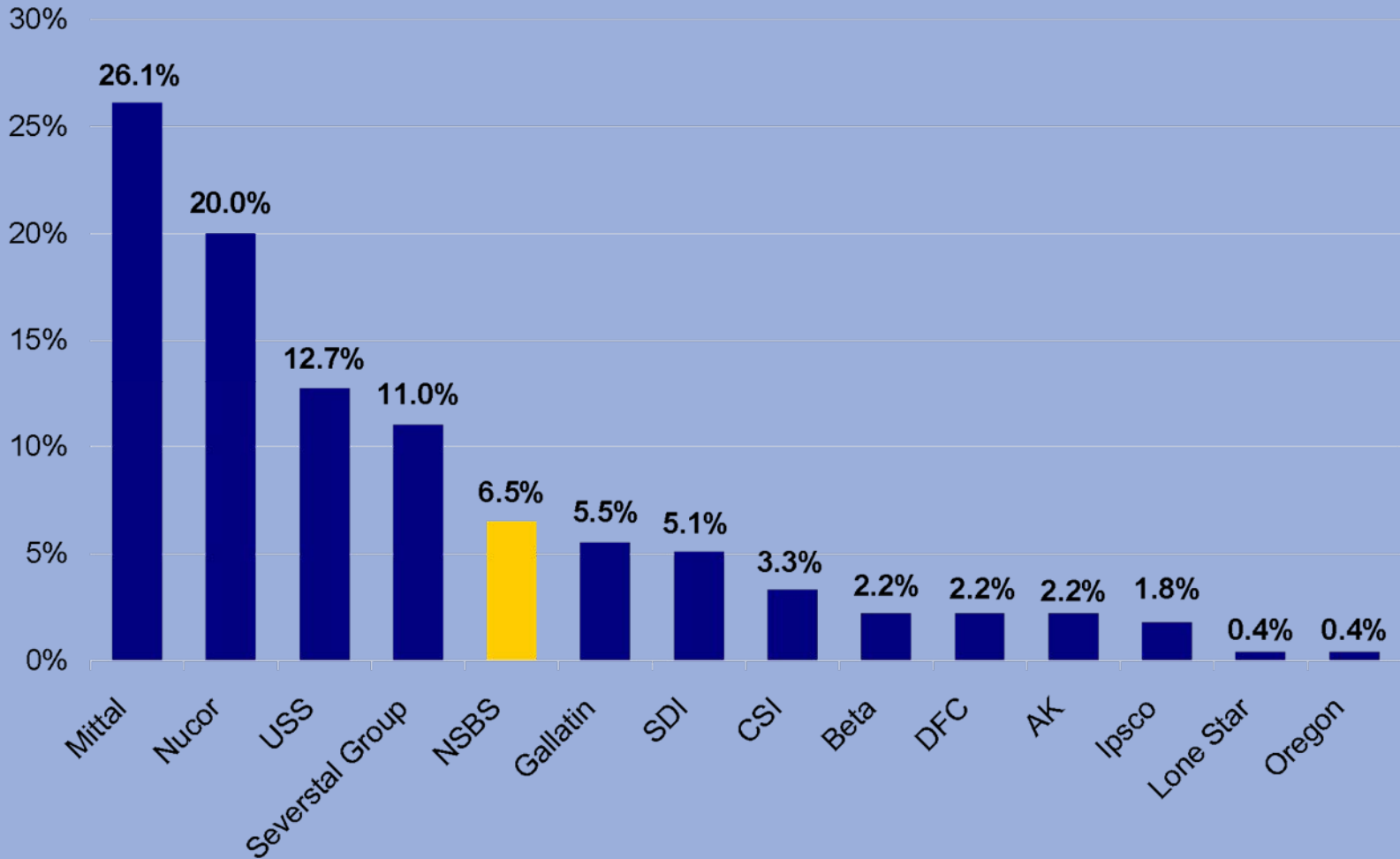


- Finished coils are moved to the coil storage yard on-site, where they sit for two to three days to cool before customer pick-up. Finished product is loaded onto railcars or trucks with a crane or forklift at the loading station
- 60% of finished goods are shipped out via truck and the remaining 40% are shipped by rail

Customer Markets

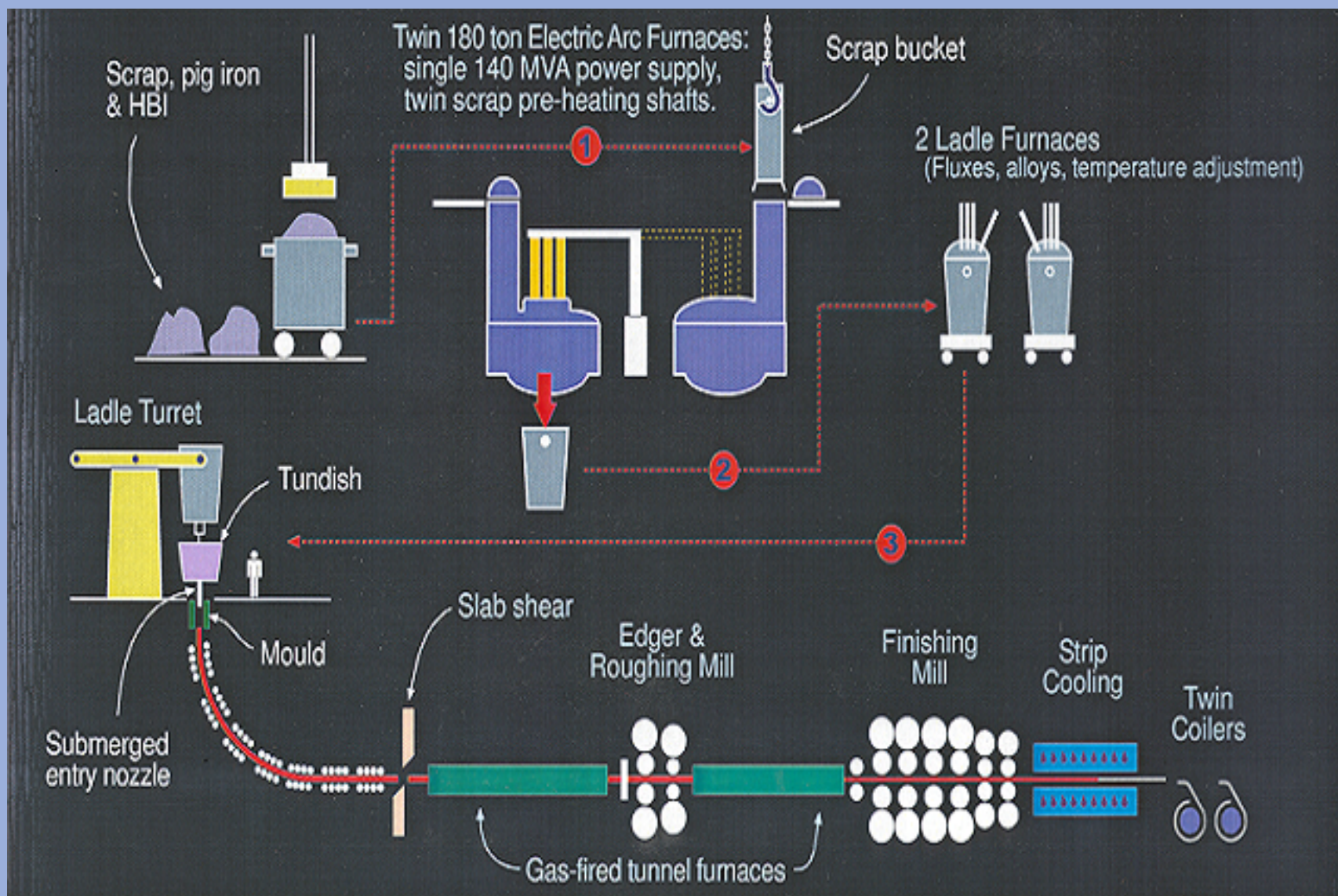


Hot Rolled Market Share Analysis



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The Mill Uses a Lot of Electricity

- Average 1 billion kwhrs/year
- Plant is fed directly from a 345,000V power line
- Electric Arc Furnace demands about 100MW while arcing
- HSM demands about 60MW while running

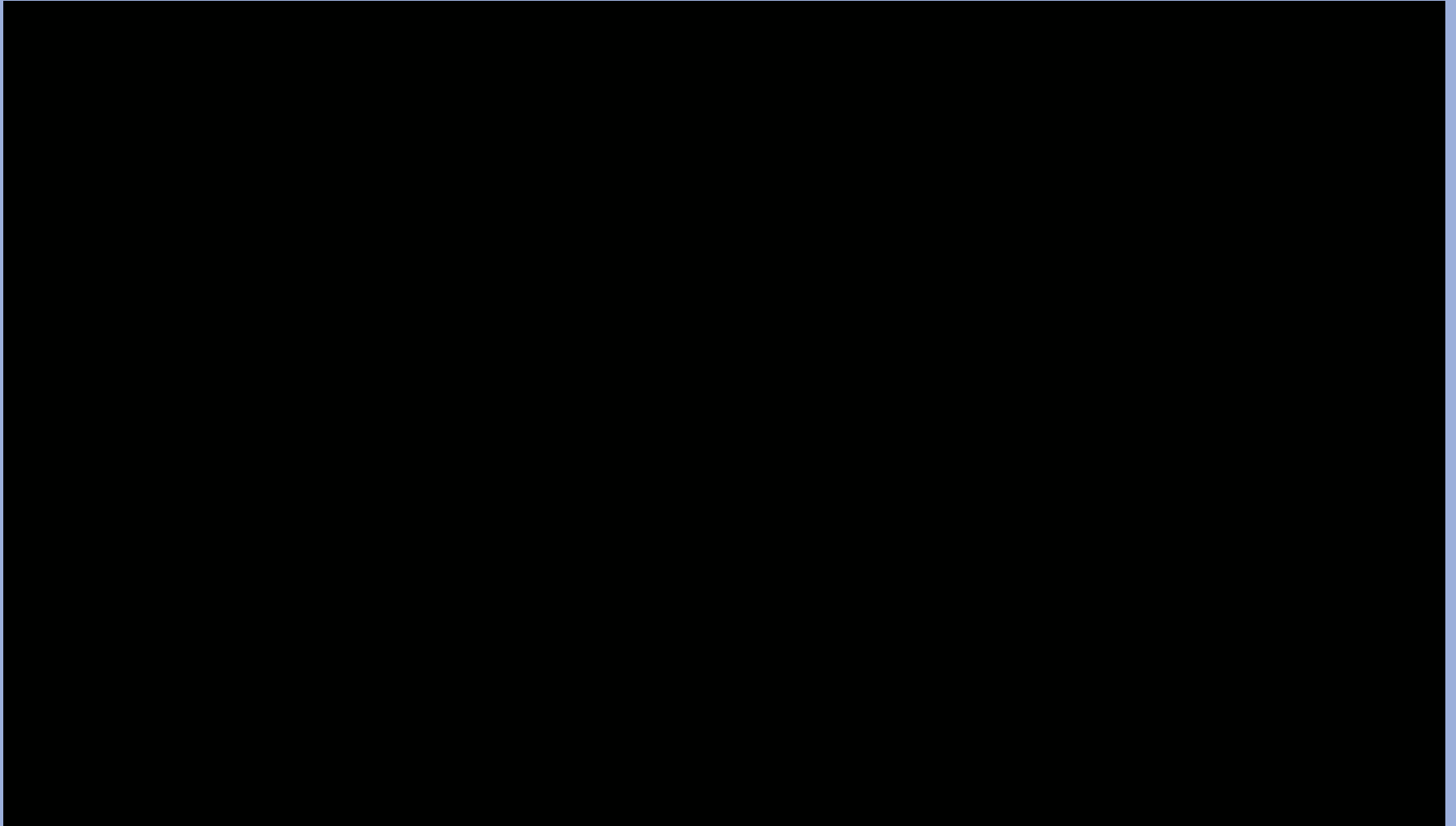




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Arc Furnace Uses A Lot of Energy



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**HSM has over 100,000 HP in
Motors**



Third-Party Assistance

- Through ODOD and DOE funding, a third-party (Hatch Engineering) was hired to review our plant and assist us with energy improvements.
- Two Elements:
 - Cultural Changes
 - Specific Energy Projects



Cultural Assessment

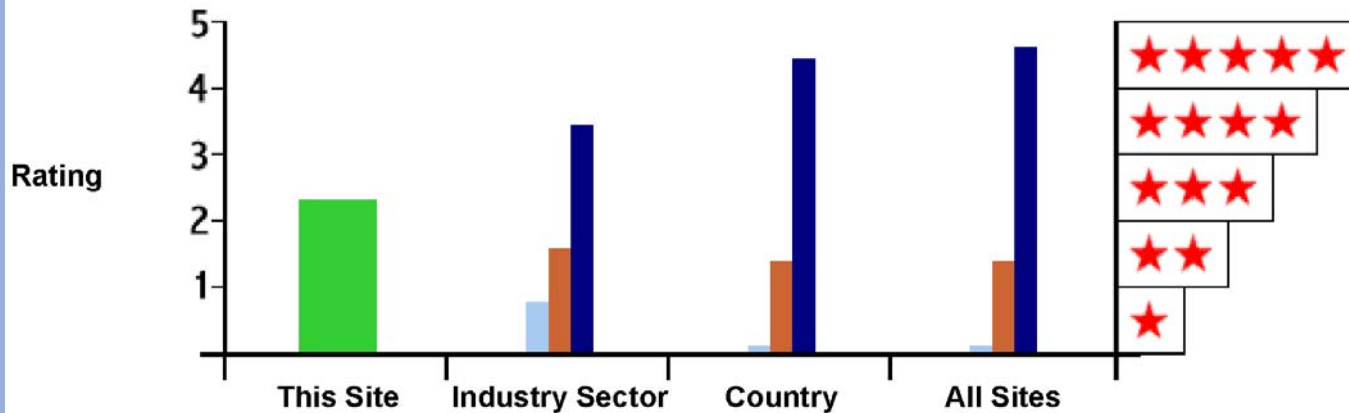
- Hatch conducted One-2-Five[®] sessions
 - One-2-Five means that through specific questions we evaluate ourselves 1 to 5 stars in 22 elements in 10 distinct areas of energy management.
 - These results are then compared to all results (over 1800 companies worldwide), to our country (1200 sites), and our industry (39 sites)
 - Because of the departments involved, our plant was treated like 3 different plants (EAF, LMF/Caster, and HSM)

One-2-Five®



One-2-Five Results - EAF

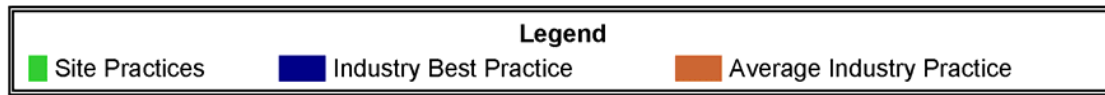
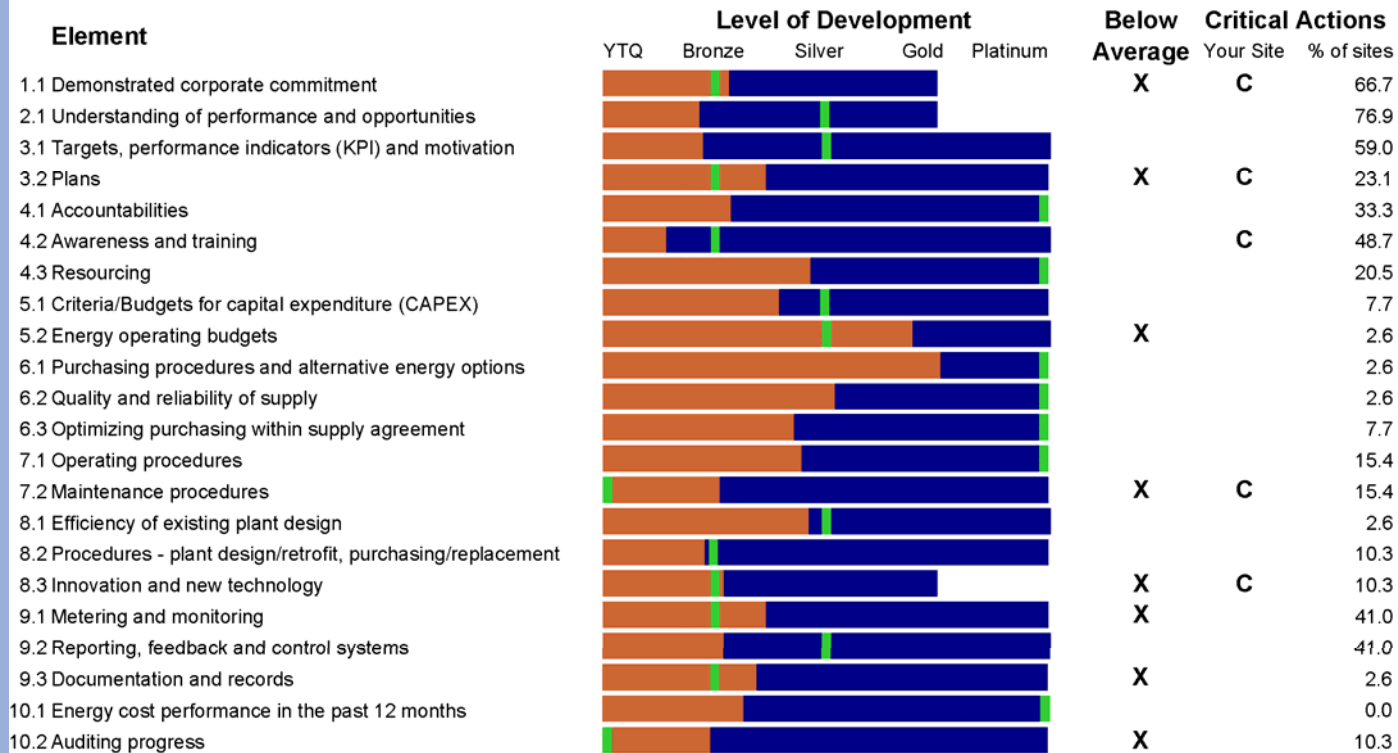
North Star Bluescope Steel LLC
 Industry Sector: Basic Iron and Steel Manufacturing
 This Site's International Benchmark Rating is 2.33
 One-2-Five Star Rating is 3 stars



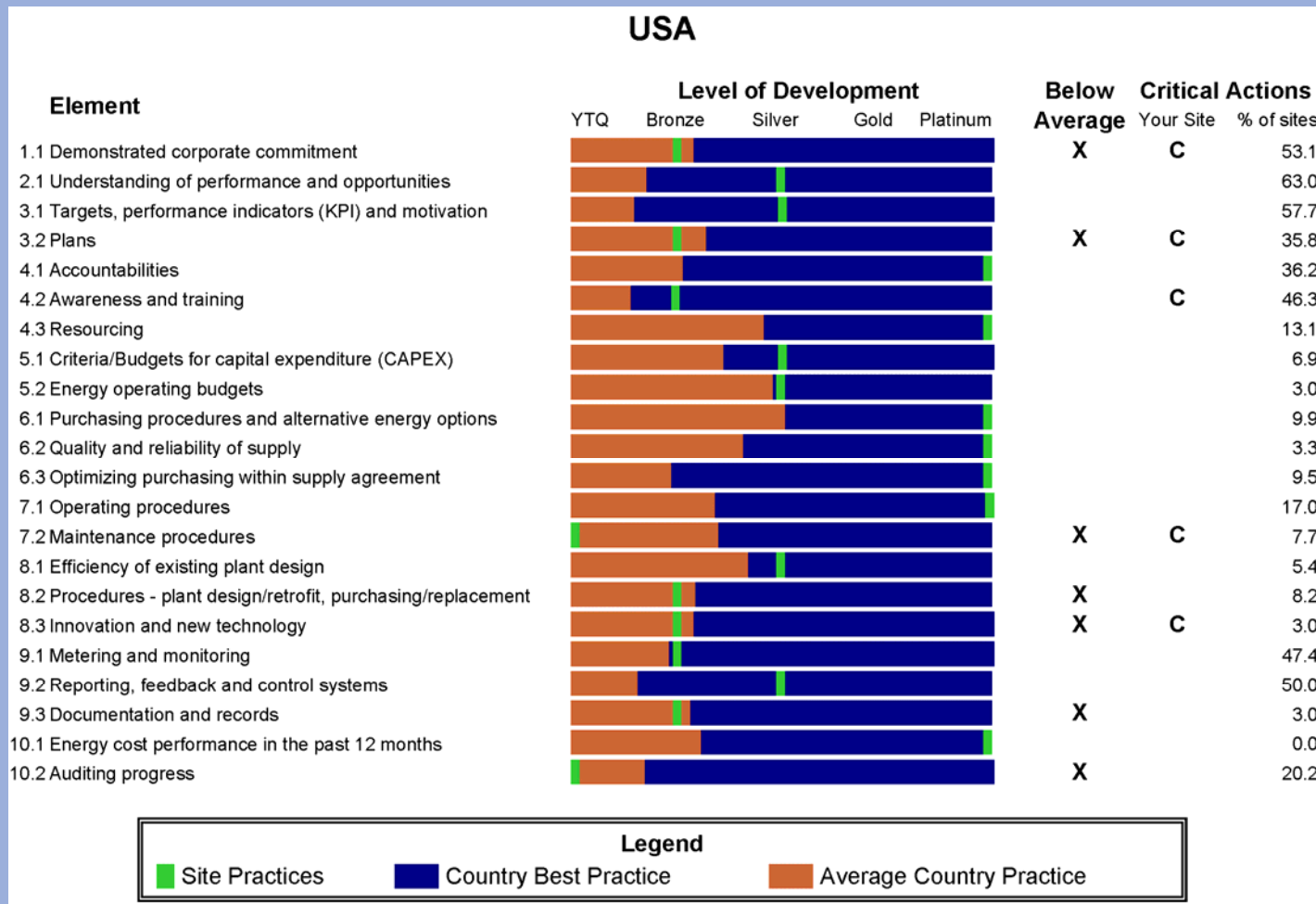
	Industry Sector	Country	All Sites
	Rating	Rating	Rating
■ Maximum Score	3.44	4.44	4.62
■ Average Score	1.58	1.37	1.38
■ Minimum Score	0.79	0.12	0.12

One-2-Five Results - EAF

Basic Iron and Steel Manufacturing

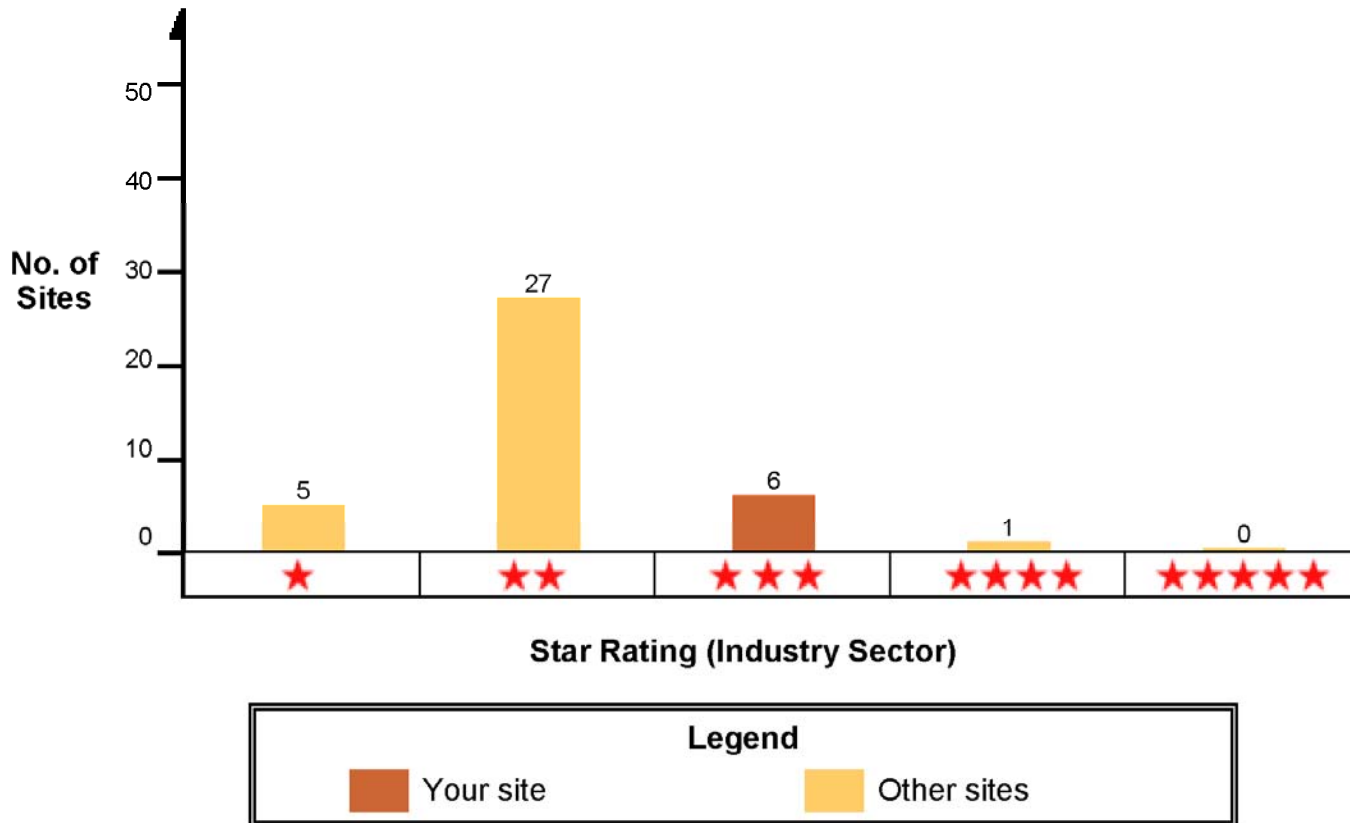


One-2-Five Results - EAF

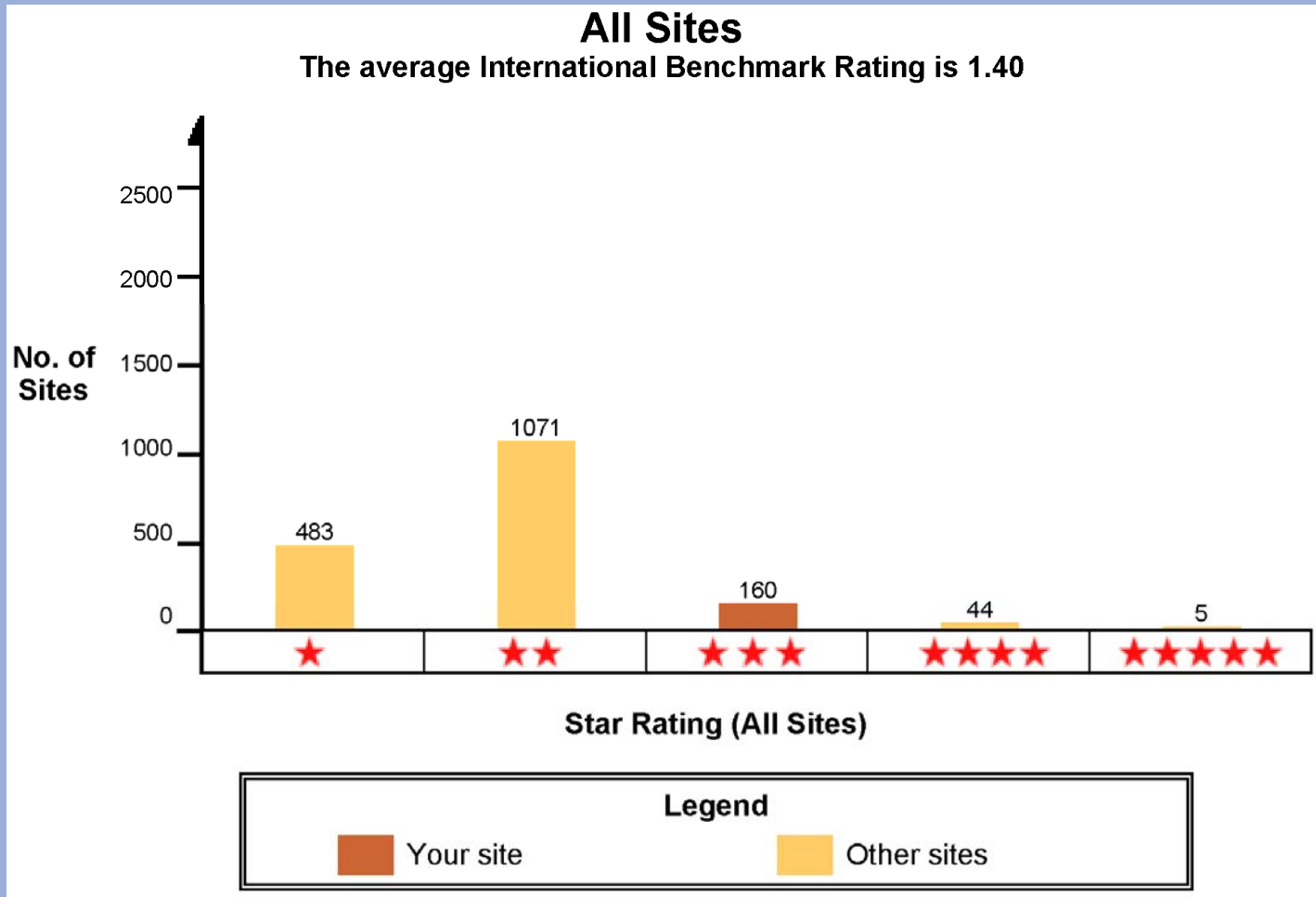


One-2-Five Results - EAF

Basic Iron and Steel Manufacturing
The average International Benchmark Rating is 1.60



One-2-Five Results - EAF



One-2-Five Summary

Diagnostic Session	Star Rating (out of 5)	International Rating (out of 5)
Melting	☆☆☆	2.33
Casting	☆☆	1.48
Rolling	☆☆	1.42
Best Practice in Iron and Steel	☆☆☆☆	3.44
Best Practice – All Sectors	☆☆☆☆☆	4.62

Cultural Issues Needed to be Addressed



Energy Team Created

Energy Champions

EAF	Renee Findling
	Willie Jackson
Caster	Gary Pierce
	Kevin Kwiatkowski
HSM	Rob Twigg
	Luke Stoup
Central	Matt Morris
	Jerry Zalecki

Training Conducted

- Hatch developed a training class held on site open to all team members
- 80 team members attended
- Trained on:
 - Results of assessment
 - Energy prices and current issues specifically for North Star BlueScope Steel
 - Technology Awareness (VFDs, Heat Recovery, etc.)
- Held discussions on specific ideas from attendees



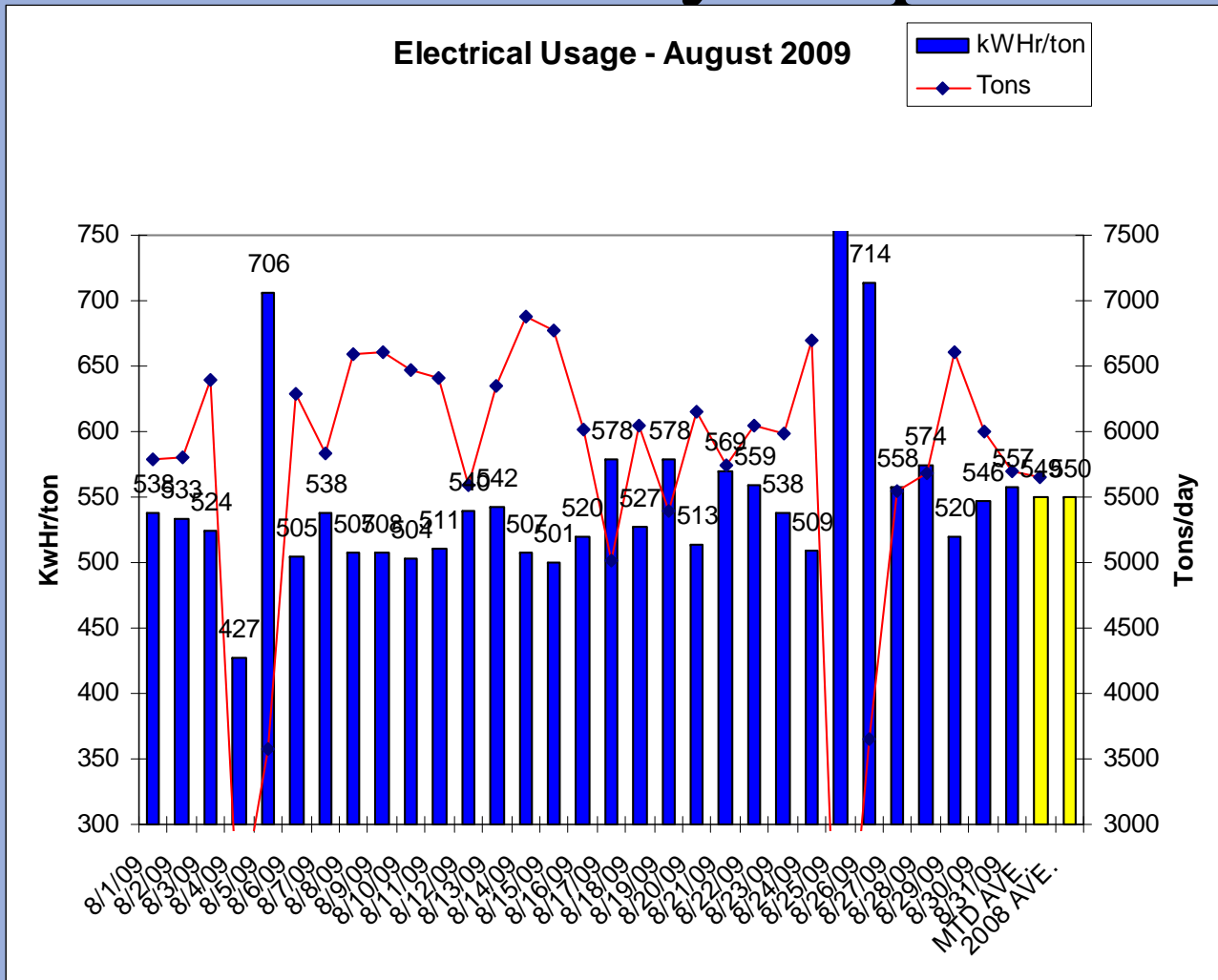
Management Buy-in/Awareness



- Daily Reports were developed for Electricity and Natural Gas
- Daily data points are reviewed in the manager's daily meeting
- Corporate level statistics are shared by e-mail monthly
 - These also include Greenhouse Gas Emissions

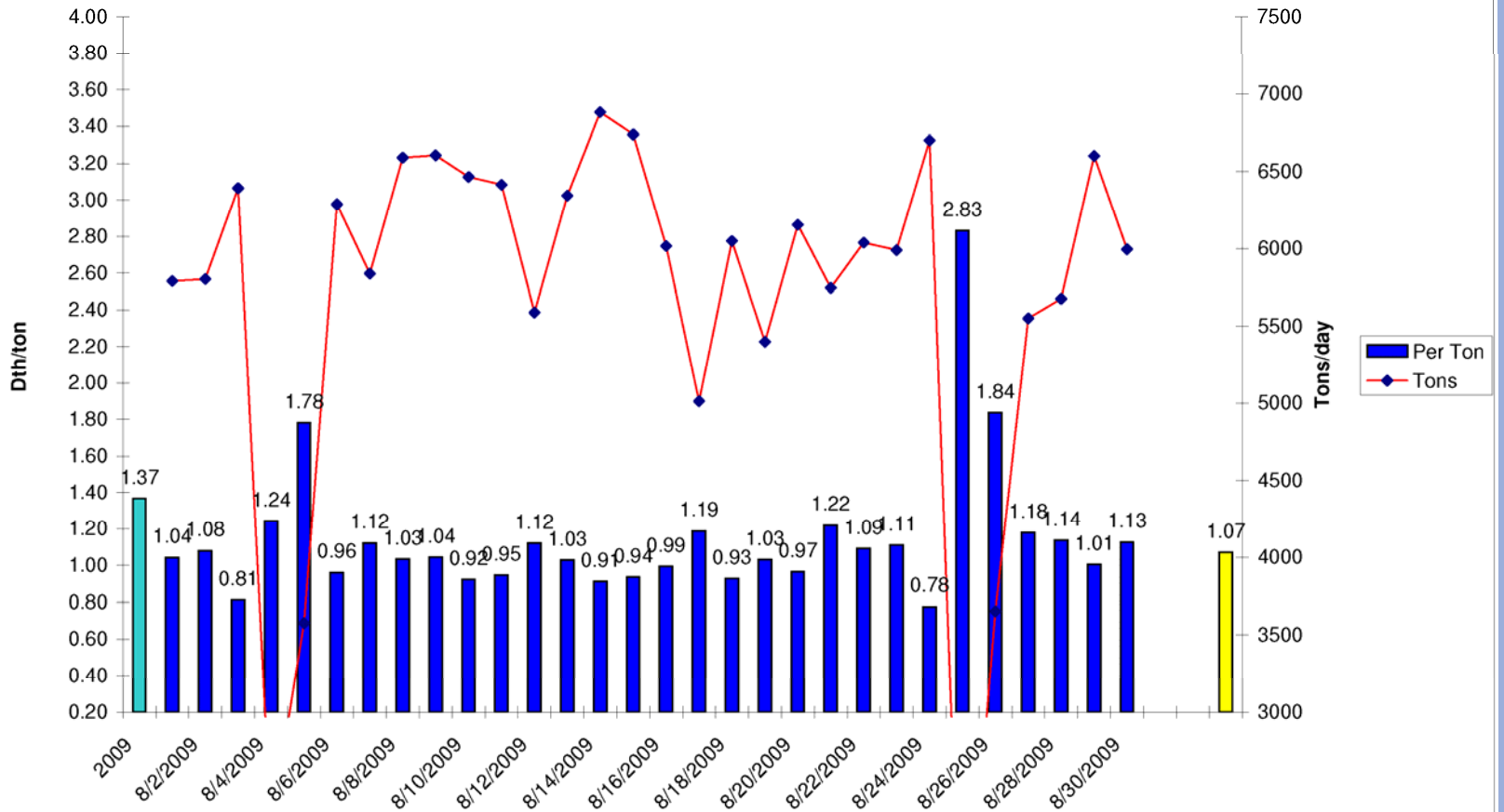


Electricity Report



Natural Gas Report

Gas Usage - Aug 2009

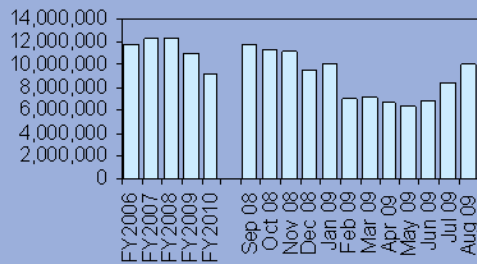


BlueScope Energy Use Report

ENERGY USE

Gigajoules per month

BLUESCOPE STEEL

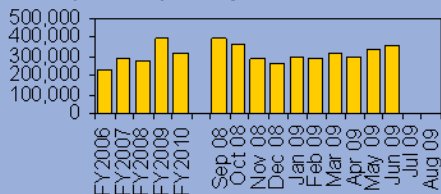


COMMENTARY

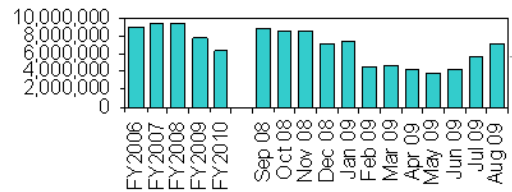
BlueScope Steel saw an increase in energy use for the month this was associated with increases in production at PKSW and NSBSL.

Energy consumption for NZS, WP & ICP was consistent with the previous month.

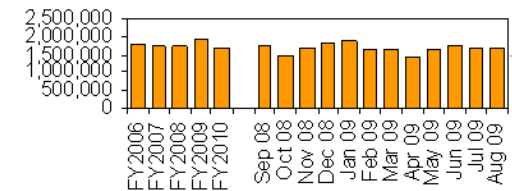
OTHERS* updated quarterly



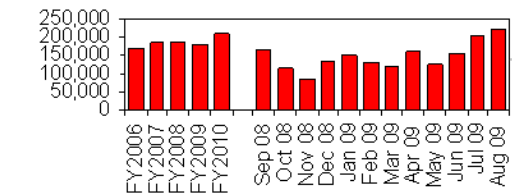
PORT KEMBLA STEELWORKS



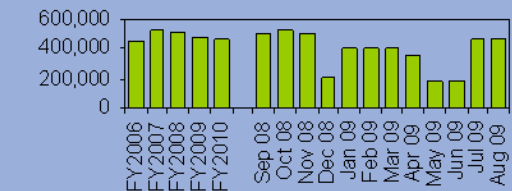
NEW ZEALAND STEEL



NORTH STAR BLUESCOPE STEEL 50%

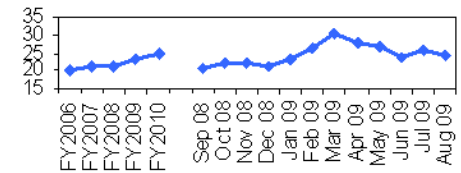


WESTERN PORT



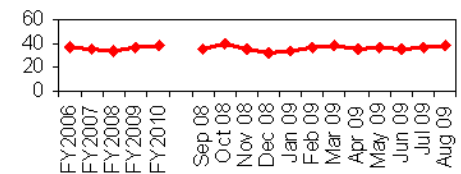
PKS Intensity

GJ / Tonne Raw steel



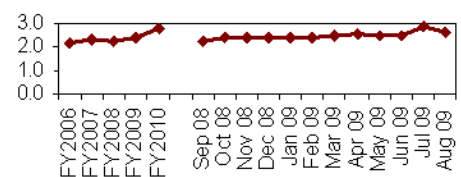
NZS Intensity

GJ / Tonne Raw steel

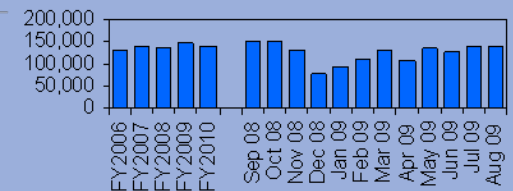


NSBSL Intensity

GJ / Tonne Raw steel



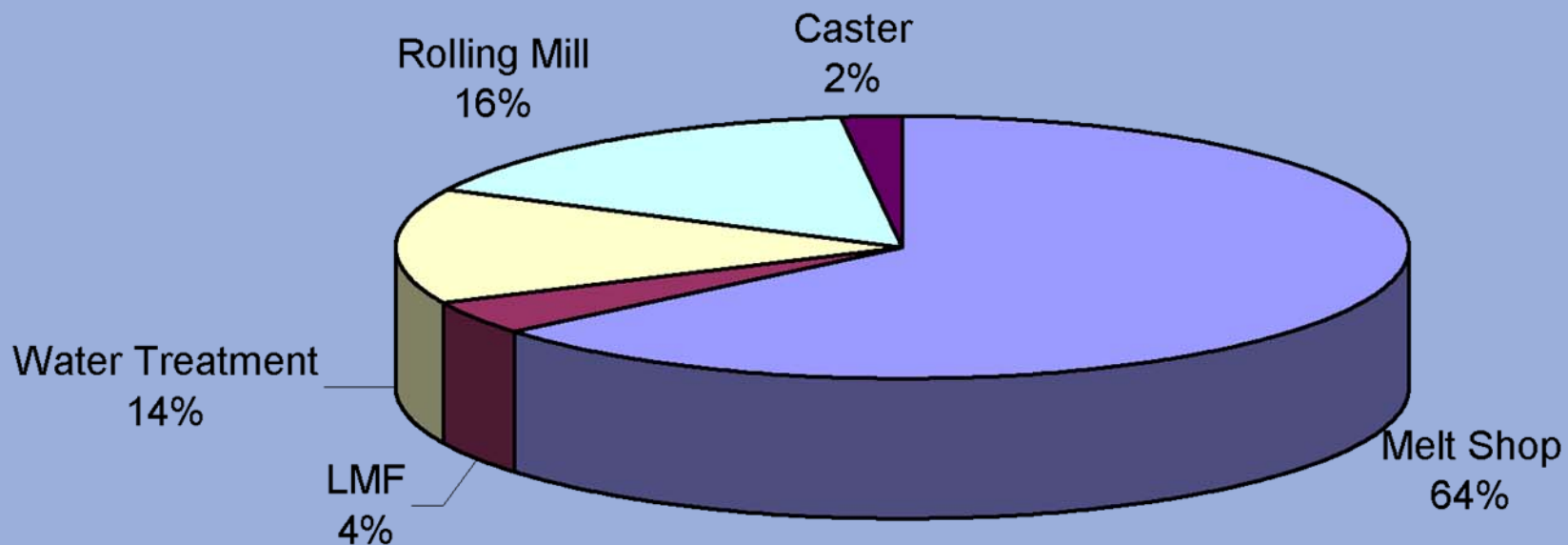
ILLAWARRA COATED PRODUCTS



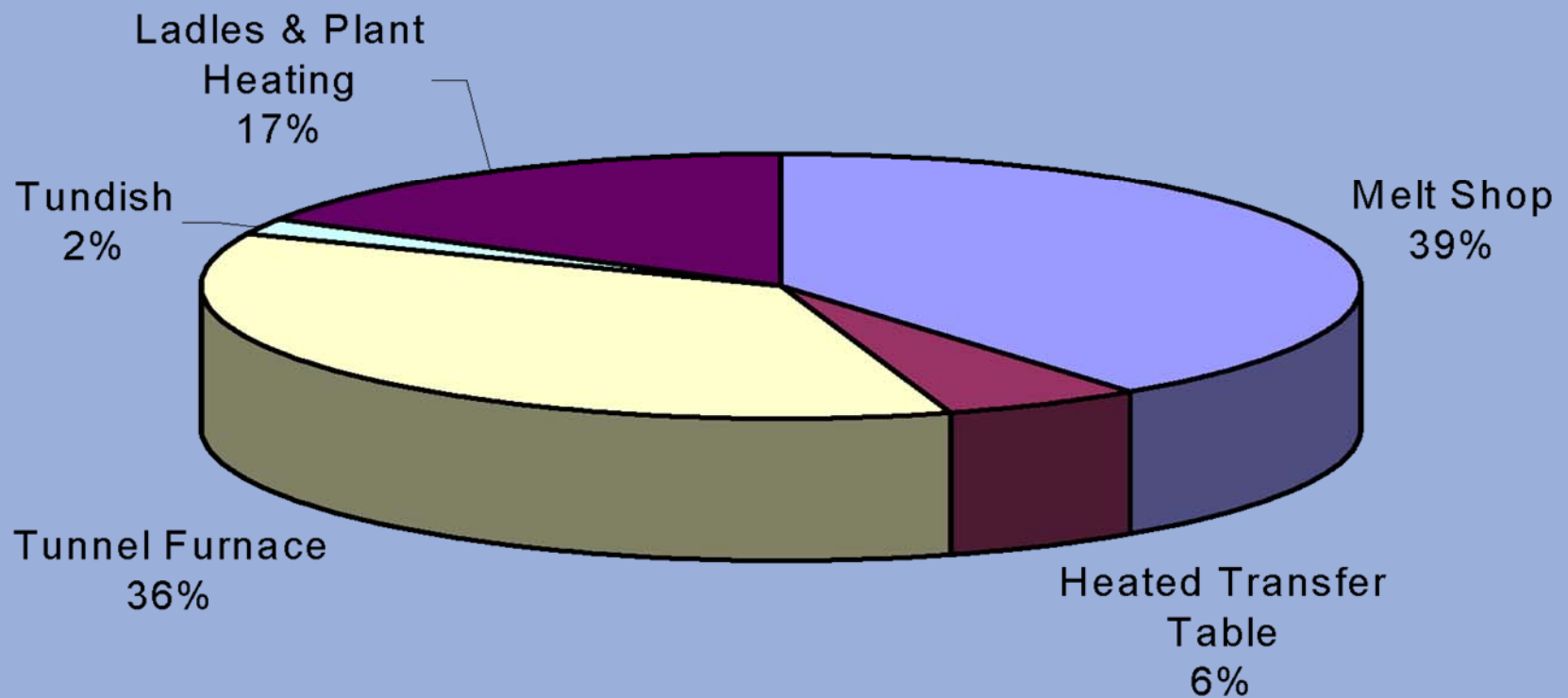
Specific Projects

- Hatch also assisted us in reviewing raw data and gathering up ideas and projects to come up with some of their own recommendations
- These were handed off to the Energy Team
- Several have been completed/closed
- Many more are still evolving to viable solutions

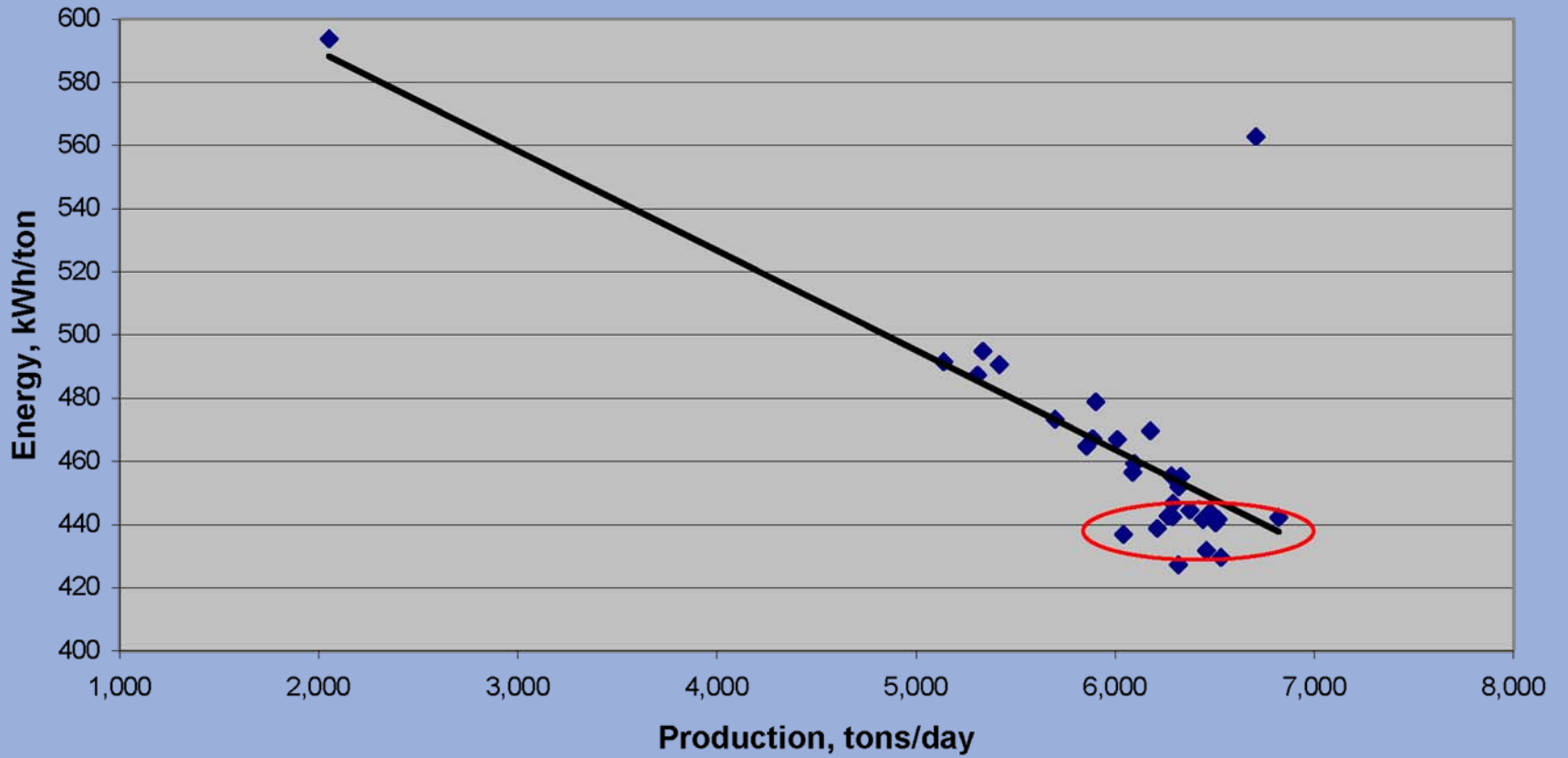
Electricity Usage 2006



Natural Gas Use 2006



Electricity Per Ton July 2006



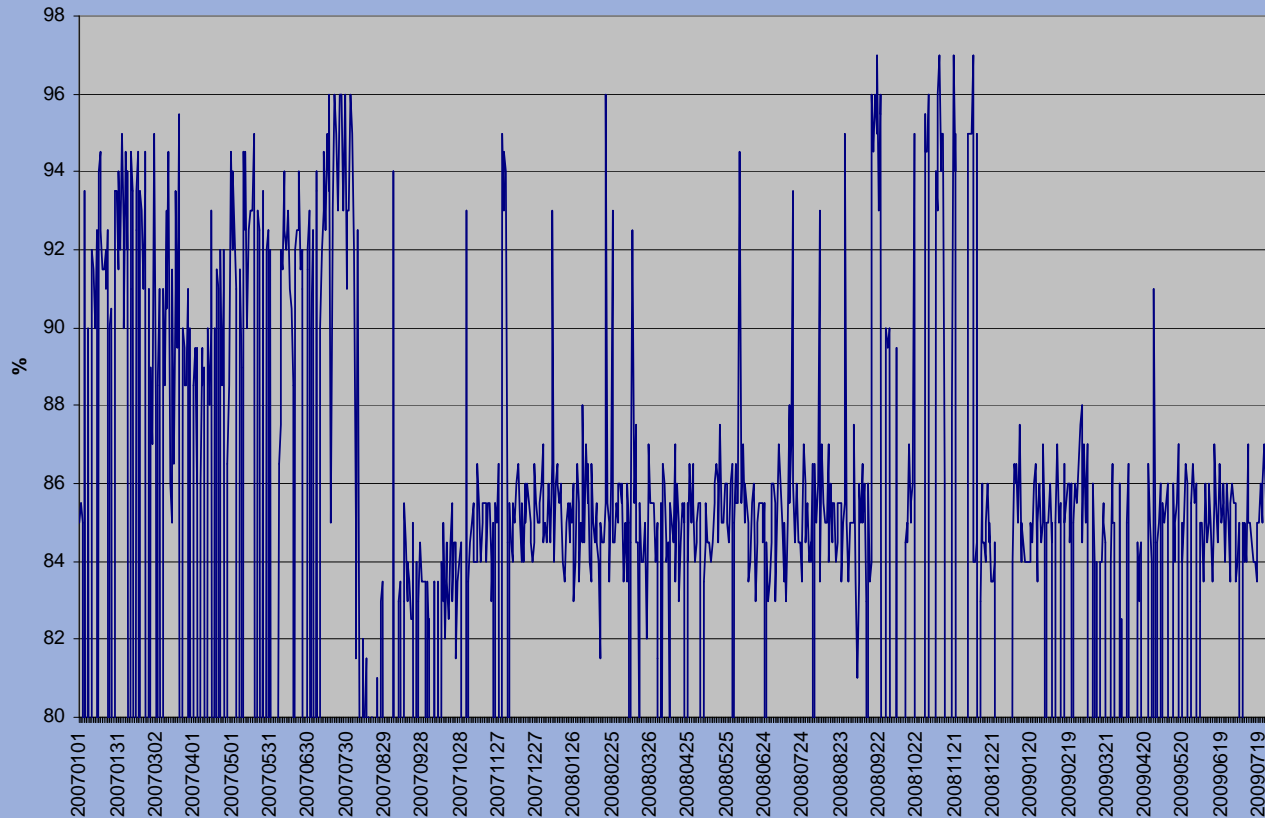
Technical Opportunities Identified

- Utilize waste heat from operating EAF to preheat scrap in charged furnace
- Install rigid refractory insulation in the EAF
- Install High Emissivity Panel Coatings in EAF and LMF
- Switch the East Baghouse ID Fans from 2 fan operation to single fan operation
- Install air receivers in the areas of the mill that use the most compressed air
- Add recuperative heating to ladle and tundish preheaters
- Install recuperation on heated transfer table blowers
- Install hinged ladle lid system

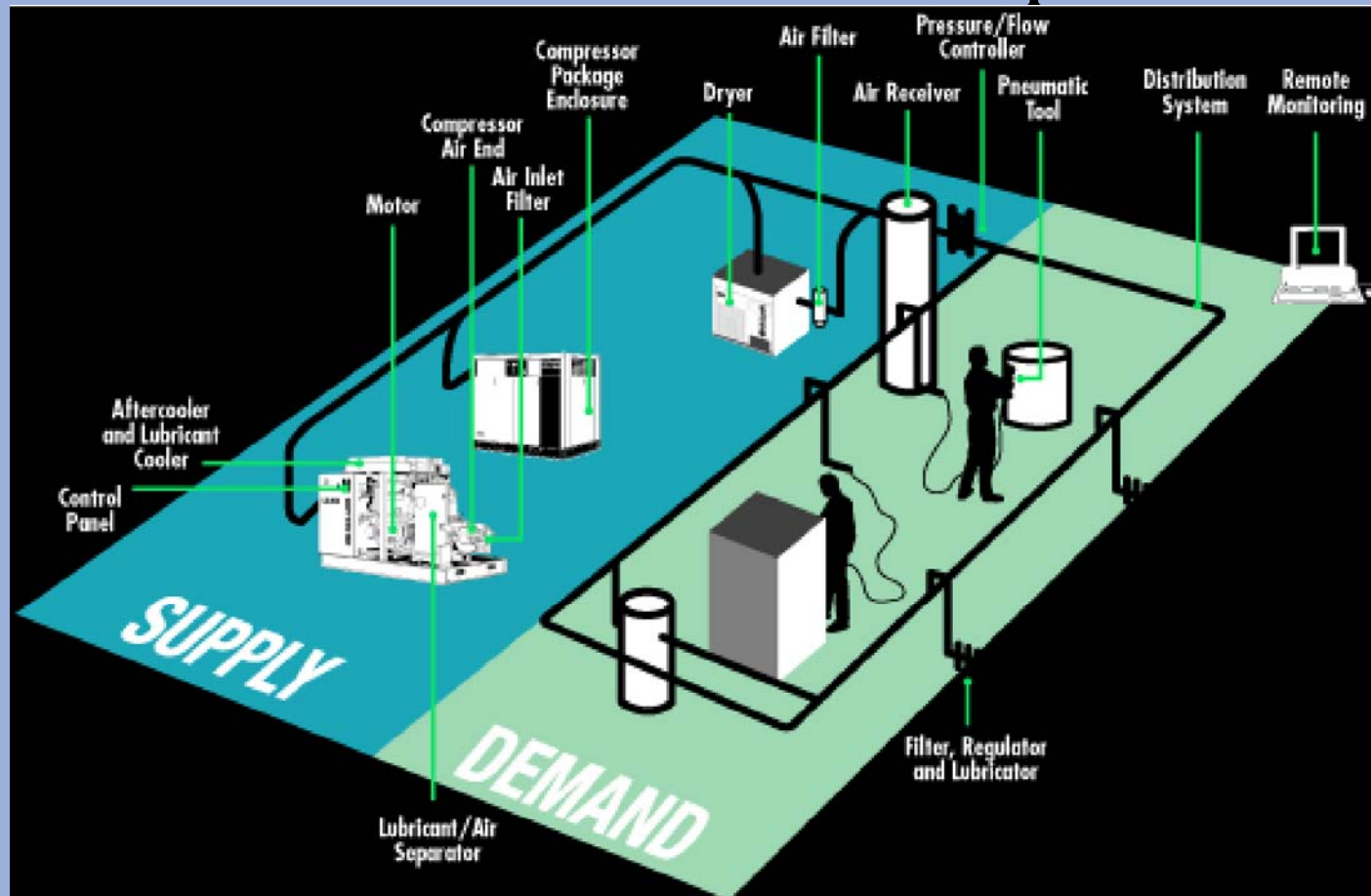


Switch the East Baghouse ID Fans from 2 fan operation to single fan operation

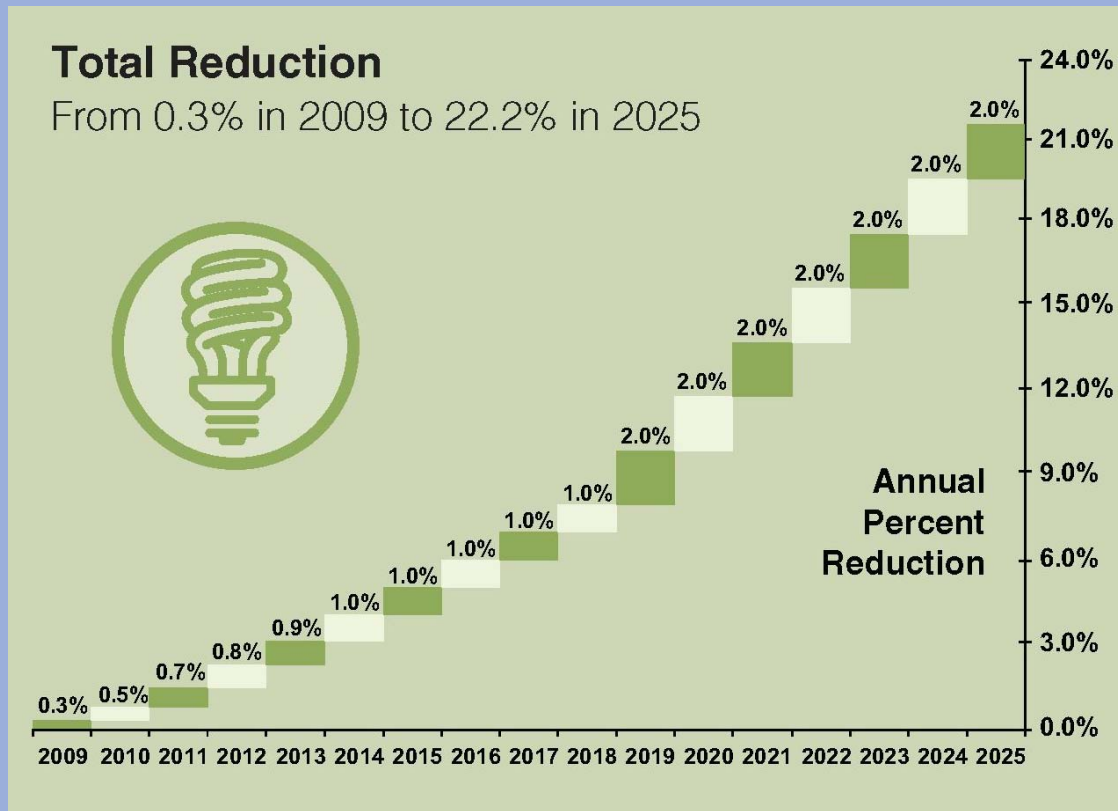
EBH ID Fan Current Setpoints



Install air receivers in the areas of the mill that use the most compressed air



Both projects are going to assist us in avoiding Ohio's new Energy Efficiency/Demand Reduction Rider



Summary

- North Star BlueScope Steel has been able to assess our current energy status through funding from the ODOD and DOE.
- With Hatch Engineering help, we have developed plans to improve our energy awareness and culture
- We also continue to develop specific projects designed to improve our energy efficiency