

HINDALCO INDUSTRIES LIMITED

BELUR WORKS

(I) Unit Profile :

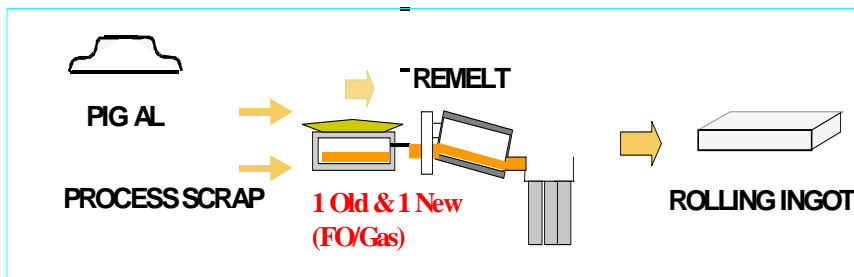
Our Belur Plant has three Key Manufacturing Processes are:

- (a) **Remelting and Casting**
- (b) **Hot Rolling**
- (c) **Cold Rolling & Finishing**

The Belur Unit of Hindalco Industries Limited is located in the State of West Bengal and is just 5 km from the city Kolkata. The plant was established in the year 1938 and is the oldest Aluminium Sheet Rolling Plant in the country. It has gradually grown over the years i.e. from 5000 Tonnes Per Annum and currently has a capacity of 55,000 Tonnes Per Annum. The Plant had a Annual Sales Turnover of Rs. 784.58 Crores (as on 31st March 2007). It is one of the most diversified Aluminium Sheet Factories in the world capable of manufacturing 32 different alloys and supplying to the Defence, Packaging, Bottle Closure, Pressure Cooker, Automobile and Building industry throughout India. The unit is ISO 9001, ISO 14001 and OHSAS 18001 certified. The current employee strength is 801 (as on 31st March 2007).

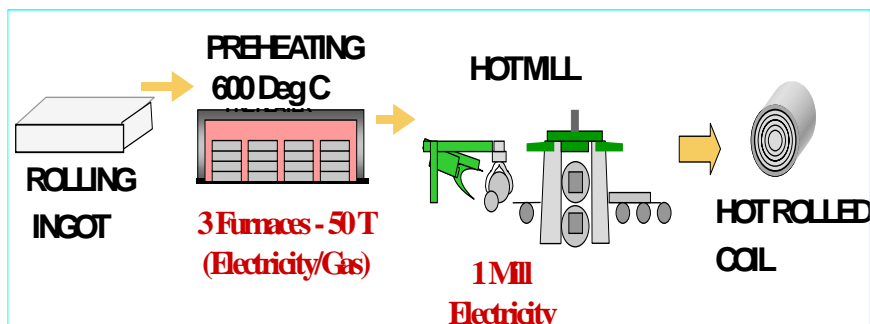
The Processes:

Remelting & Casting



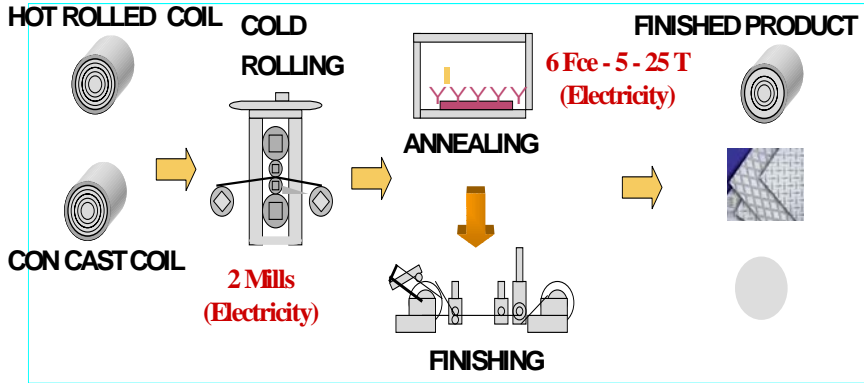
The Process involves Melting of Pig and Scrap Aluminium and Casting of Rolling Ingots using DC Casting.

Hot Mill



The process involves Preheating of Rolling Ingots in Electrically/Gas heated Preheating Furnaces and Hot Rolling to get Hot Rolled coils.

Cold Rolling & Finishing



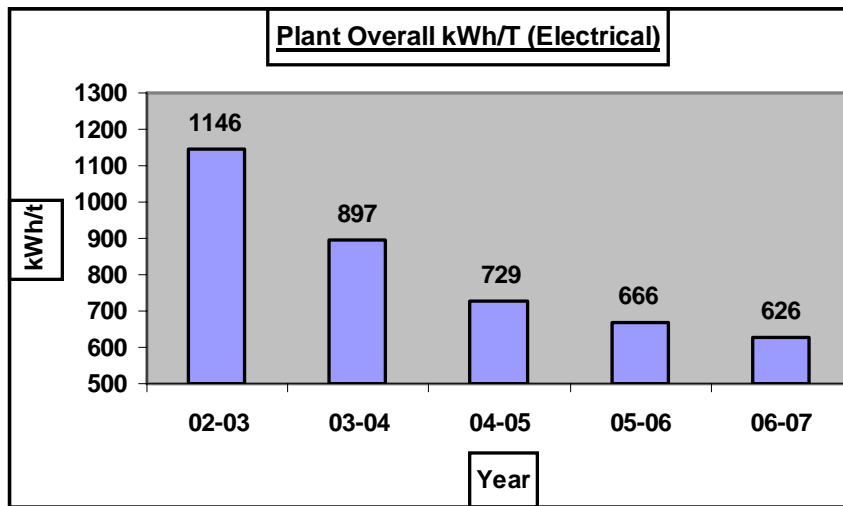
The Process involves Cold Rolling of Hot Rolled / Continuous Cast Coils in the Cold Rolling Mill and various finishing activities involving Slitting, Punching, Forming, etc. The Product is also Annealed in the Annealing Furnaces for attaining desired temper.

(ii). Energy Consumption :

The Plant consumes Energy in three forms v.i.z Electricity, Furnace Oil and Coal Gas. During the year 2006-07 the Total Plant Energy Cost comprised about 21.67% of Plant Manufacturing cost. Energy Cost is reduce 25.35% as of Manufacturing Cost within last three years. Plant also reduce 30.21% & 6.29% of Specific Energy (Electrical) & Thermal Energy Consumption, respectively and Contract Demand with utility reduce 15% within last three years. (All these Major Achievements by taking the Base Year 2003-04). The Plant has implemented a large number of Energy Efficiency Projects including Fuel Switching, Process Modifications and Process Improvement through small group activity. Major projects already having being executed during the past few years, the present thrust is on process optimisation, sustenance and involvement of more people. The Plant has also initiated Kaizen Scheme as a measure to encourage and enhance Energy Improvement initiatives.

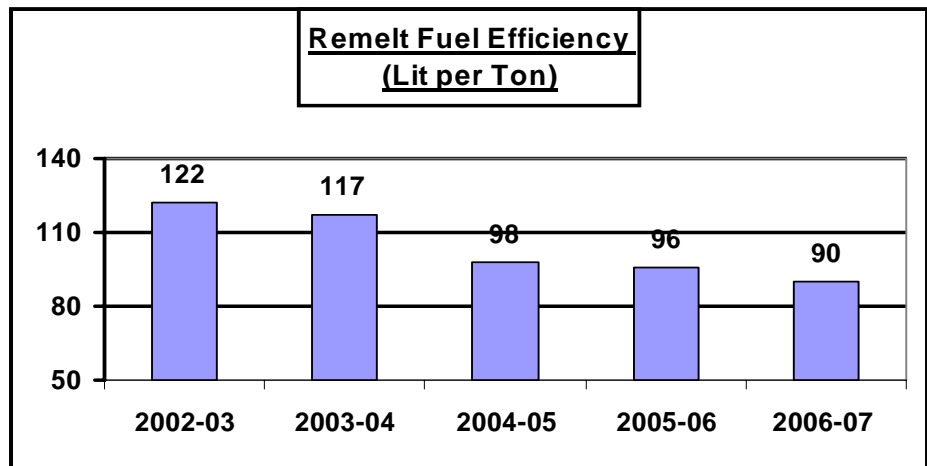
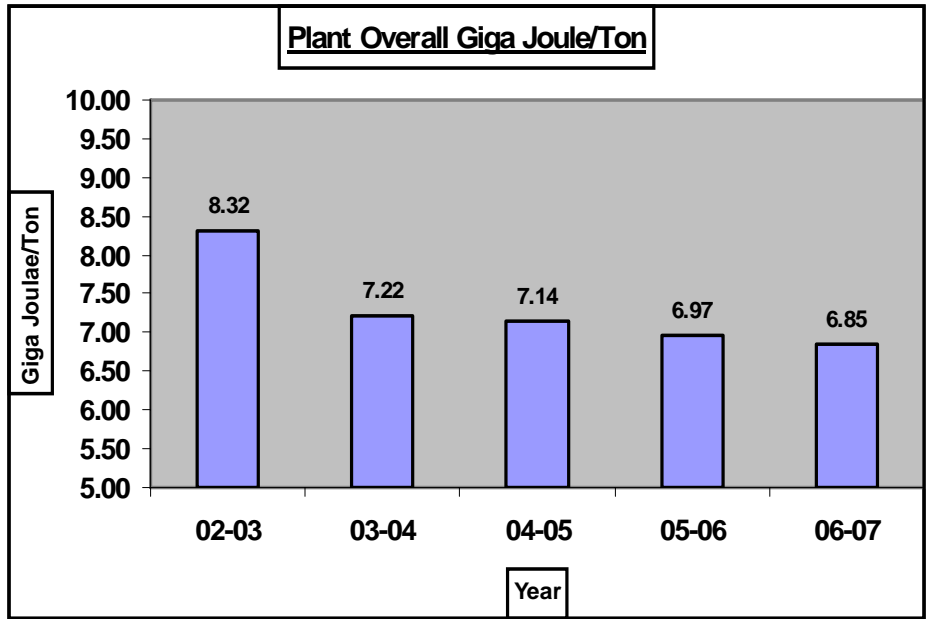
Specific Energy Consumption

PLANT OVERALL ENERGY CONSUMPTION



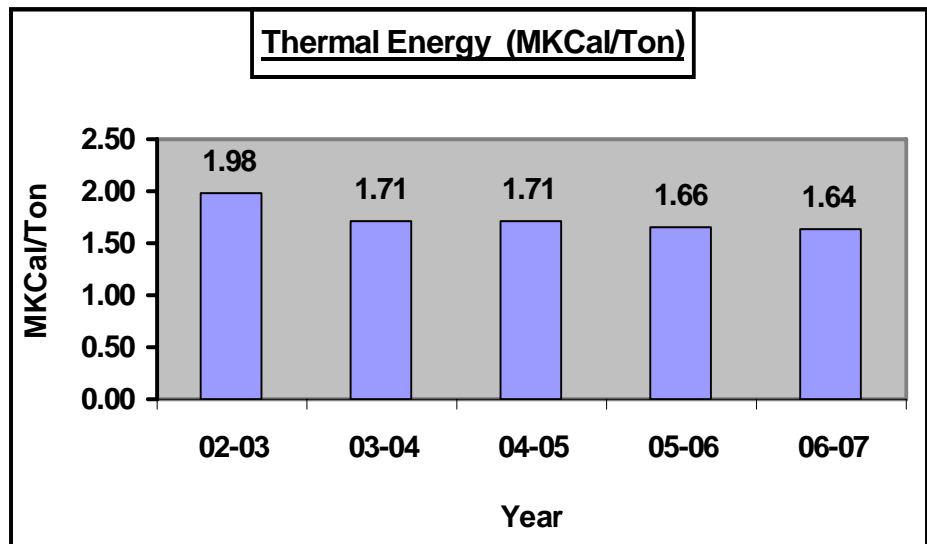
Electricity Consumption has come down rapidly due to

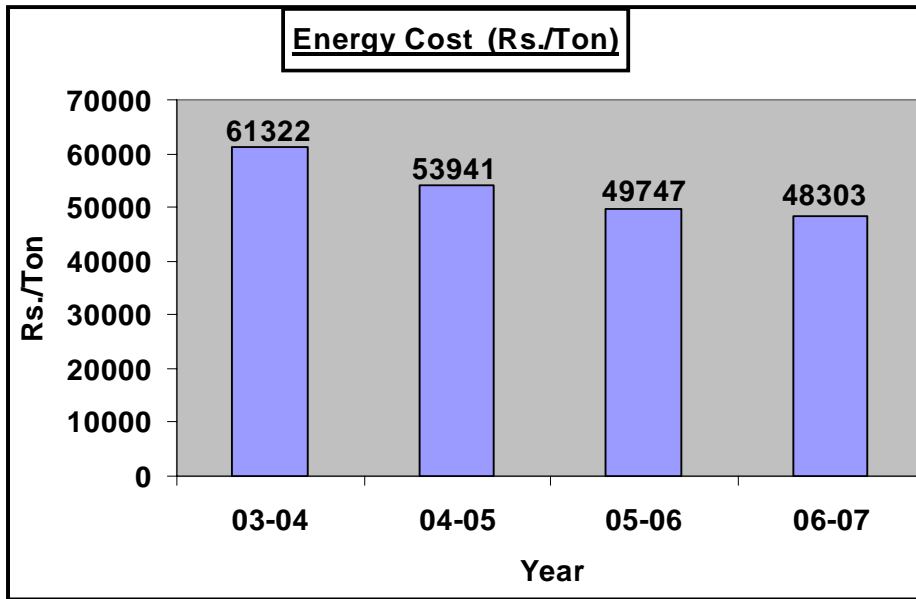
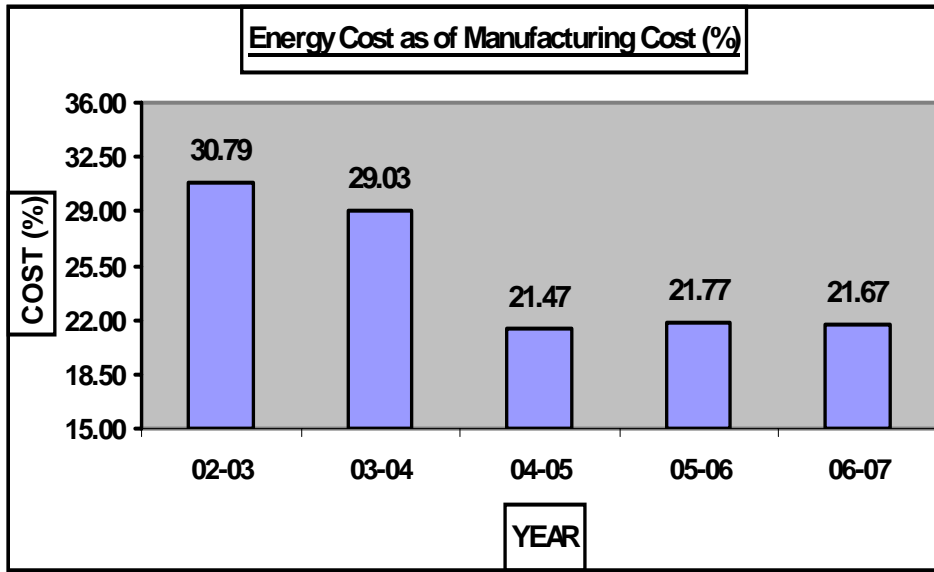
- i) Implementation of large number of EC Projects.
- ii) Operational Efficiency improvement.
- iii) Implementation of Fuel Switching Project.



Improvement in Remelt Fuel Efficiency due to:

- 1) Increase in Productivity.
- 2) Modification and tuning of Combustion System .





(iii). Energy Conservation Commitment, Policy and Organisational Set-up

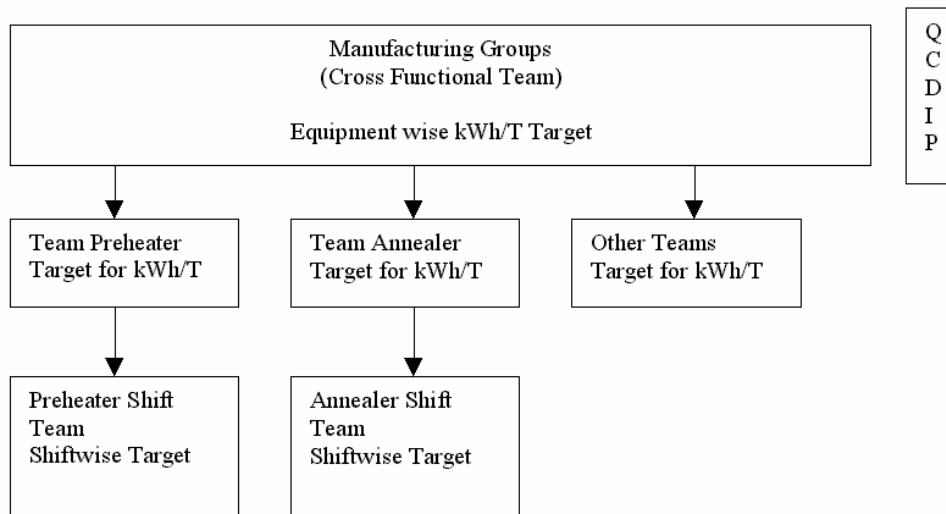
Energy Conservation Commitment is driven through Corporate Environment & Energy Policy. The unit has adopted and implemented this policy in its day to day activity. The unit has two Energy Auditor certified by BEE and the Energy cell carries out routine function of Monitoring, Reporting and facilitating Energy Projects.

Facilitating Structure and Team Based Organisation

The Plant has been segregated into three Manufacturing areas and support functions. Each of the Manufacturing Groups are Cross Functional empowered teams with defined area of operation, clear objectives and targets.

Each of the Areas in turn has number of operating teams under them. There are a total of 36 such Cross-Functional Operating Teams. Each of the team has its QCDP (Quality, Cost, Delivery & productivity) Targets derived from the unit objectives. Each team maintains details of Abnormalities identified/removed, details of meeting held, Why-Why Analysis, Innovations and Weekly/Monthly QCDP data.

Thus the Remelt, Preheater & Annealer Teams maintain kWh/T Data as part of their Cost Data. Again they monitor Tons/Load, Idle Time etc. under Productivity.



(iv). **Energy Conservation Achievements**
Details of major action taken during 2006-07:

Focus in the current year was more on stabilising and maximising benefits out of some of the big Energy Saving Projects carried during the past one year. The other focus was on advanced instrumentation. This has not only helped the unit in improving the Specific Energy Consumption but also to reduce the Energy Cost. The following table depicts the same.

	2004-05	2005-06	2006-07
Electricity Used (kWh/Ton)	729	666	626
Fuel Efficiency (Lit/Ton)	98	96	90
Total Energy Used (GigaJoule/Ton)	7.14	6.97	6.85
Total Thermal Energy (MKCal/Ton)	1.71	1.66	1.64
Total Energy Cost (Rs./Ton)	53941	49747	48303
Energy Cost as % of Manufacturing Cost	21.47	21.77	21.67

Major Actions Taken

- i) Improving Combustion Efficiency of Preheating Furnace and Installed a Recuperator of effectiveness 0.5..
- ii) Installed a Recuperator at Remelt Furnace.
- iii) Increasing the Speed of Fans of All Annealing Furnaces from 1450 RPM to 1600 RPM.
- iv) Installed the Pumps & Fans at Cooling Tower of Bliss & SMS Cold Rolling Mill.
- v) Installed VFD at Roll Coolant of Hot Rolling Mill.
- vi) Installed a Fume Exhaust Fan Motor at SMS Mill Cold Rolling Mill.
- vii) Replacement of Cooling Blower Main Drive Motor of SMS Cold Rolling Mill from 75 KW to 35 KW.
- viii) Installed an Intelligent Motor Controller at SMS Cold Rolling Mill - Hydraulic System - C
- ix) Installed an Energy Efficient Hydraulic Pump at Bliss Cold Rolling Mill.
- x) SMS Cold Rolling Mill : Coiler Slave will be OFF after the disengagement of Clutch.

Achievements

- ◆ The Unit has bagged the following Awards for its commendable improvements in the area of Energy Conservation.
- 1) “Achieved **First Position** in the **Energy Conservation Contest 2004-2005**” **Indian Oil Award for Energy Conservation 2004-2005** organized by **CII (Eastern Region)**. (Copy Enclosed)
 - 2) “Achieved as an “**Energy Efficient Unit**” in the **National Award for Excellence in Energy Management – 2007** from **CII – Sohrabji Godrej Green Business Centre**. (Copy Enclosed)

(v) Energy Conservation Plan and Targets :

	2006-07	2007-08	2008-09
Electricity Used (kWh/Ton)	626	625	600
Fuel Efficiency (Lit/Ton)	90	85	80
Total Energy Used (GigaJoule/Ton)	6.85	6.50	6.25
Total Thermal Energy (MKCal/Ton)	1.64	1.60	1.55
Total Energy Cost (Rs./Ton)	48303	47750	47500
Energy Cost as % of Manufacturing Cost	21.67	20.50	20.00

Major Projects to be undertaken during 2007-08 & beyond

Energy Conservation Measures (Planned - 2007 - 2008)	Anticipated Savings in		Approx. Investment (Rs. Lakhs)	Project Commencement & Completion Year
	Energy Value (Lakhs kWh)	Rs. Lakh / Year		
1) Reducing the Speed of the Idle running Fume Exhaust Fan Motor of the Bliss Cold Rolling Mill.	0.11	0.40	0.00	2007-08
2) Installation of Star Delta Controller at the Bliss Cold Rolling Mill Cartidge Filter & Hydraulic Pump and Finishing Line Machine Motor.	0.21	0.80	0.30	- Do -
4) Installation of Dilution Air Blower of the 1500 NM ³ / Hr.Flow Capacity and 150 MM WC Total Pressure at New Remelt Furnace.	0.08	0.30	0.70	- Do -
5) Installation of Interlock System at the Uncoiler Drive at the New Circle Punching Machine.	0.07	0.25	0.00	- Do -
6) Installation of Interlock System at the Coiler Drive at the Tension Leveller Degreasing Oil Supply & Return Pump and Blower.	0.13	0.50	0.00	- Do -
7) Installation of Start / Push Button for Idle running of Hot Mill CT Fans & Pumps.	0.05	0.20	0.15	- Do -
8) Installation of 1800 CFM Centrifugal Air Compressor with Energy Saving Features.	3.24	12.30	50.00	- Do -
9) Installation of Dross Press at the Remelting Furnaces.	4.97	18.90	80.00	- Do -
10a) Installation of Recuperator at Preheating Furnace No. 1	0.87 Lakh	33.00	25.00	- Do -

b) Installation of PLC based Control System for fine Tuning of Air Fuel Ration Control.	Therms / Year			- Do -
c) Removal of Old Unused Duct & plugging the same with Insulating material.				- Do -
d) Installation of VFD for ID Fans at Preheating furnaces.				- Do -
Total Nos. Of Projects :- 10	11.72	66.65	1.15	- Do -