

HINDALCO INDUSTRIES LIMITED **RENUKOOT; SONEBHADRA; U.P.**

COMPANY PROFILE

Hindalco Industries Ltd. (Hindalco), a Flagship Company of the Aditya Birla Group is a Pioneer non-ferrous metals powerhouse. Hindalco was incorporated in 1958. It's Renukoot unit was set up in technical collaboration with Kaiser Aluminium and Chemicals corporation, USA and commenced commercial production in 1962.

Hindalco, at Renukoot, houses a fully integrated plant, comprising of 3 main plants i.e. Alumina, Smelter & Fabrication Plants. Hindalco produces some Byproducts, which include Gallium Metal, Vanadium Sludge and Aluminium Dross. Each plant employs varying Technology. With integrated facilities, output from various plants is used by next, along with varying raw materials. Company has its own captive power plant at Renusagar (30 Km away from Renukoot) with installed capacity of 741.7 MW and 78 MW of Co Generation Plant at Renukoot itself.

Alumina Plant: - It was commissioned with an initial capacity of 40,000 MTPA, which has now increased, to 700000 MTPA. The plant has been expanded in phases using new technology from time to time for energy efficiency and capacity enhancement. It employs the basic Bayer's process and the major raw materials for the plant are Bauxite, Steam, Caustic Soda and Furnace oil.

Aluminium Smelter: - It has 11 Pot lines with 2067 Pots installed with annual production capacity of 3,45,000 MT. The Smelter employs the Hall Heroult Electrolysis Process for the extraction of Aluminium from Alumina. Basic raw materials for the smelter are Alumina, Power, Anodes and Aluminium Fluoride.

Fabrication Plant (Value Added Products): - The Fabrication Plant at Renukoot comprises of 4 Main Sections Remelt Shop, Cast House, Rolling Mills, Extrusion & Conform which produce Wire Rod, Slabs/Billets, Rolled, Coils and Extruded Products.

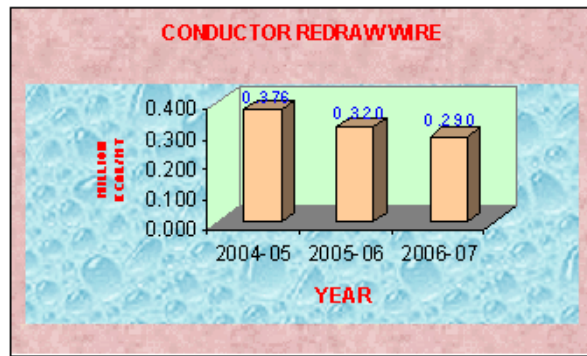
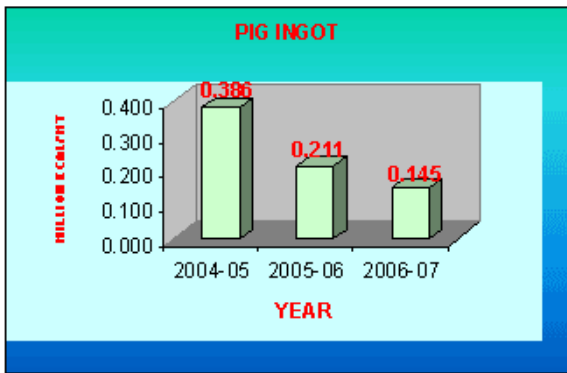
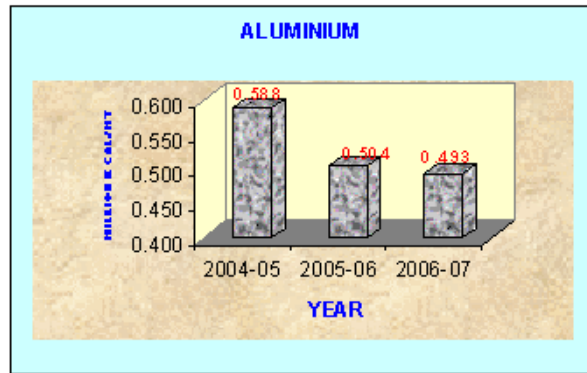
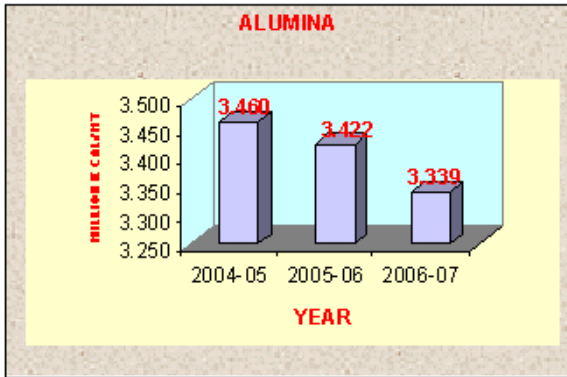
Hindalco, an ISO 14001, ISO 9001:2000 and OHSAS 18001 Company. Recently these three system have integrated as IMS (Integrated Management System).

Today Hindalco occupies a place of pride in the global aluminium scenario with its most efficient working in all areas of operations. The company has kept pace all along with latest development in aluminium technology and has upgraded its manufacturing facilities. Hindalco has bagged 15 prestigious International & National Awards for Business Excellence, IT, Quality, Energy Conservation and its efforts for preserving the Environment in FY 06-07.

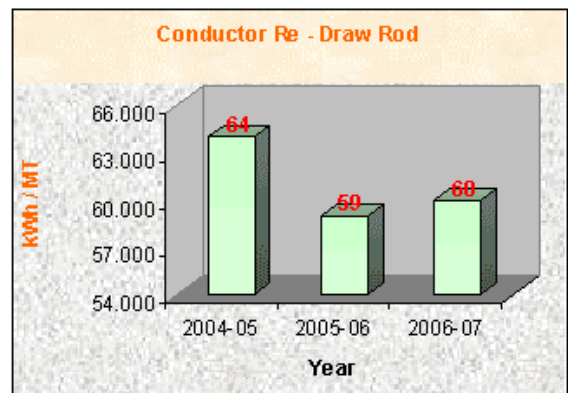
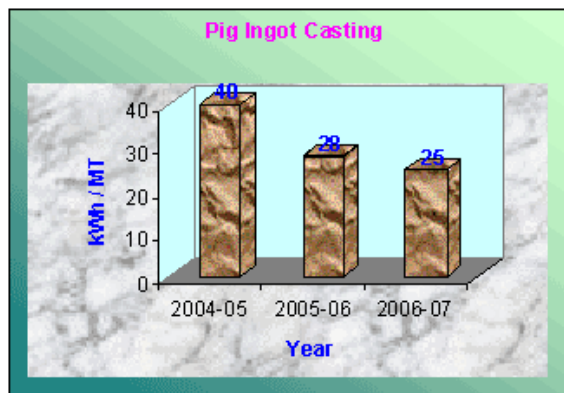
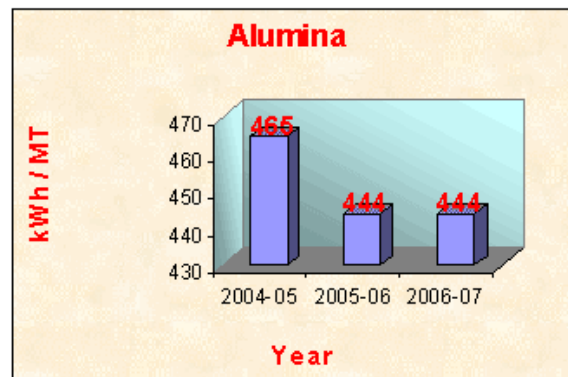
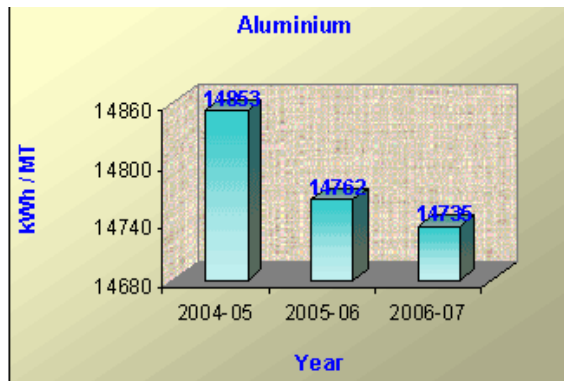
ENERGY CONSUMPTION

Manufacturing of Aluminium is one of the most energy intensive process. The cost of Energy comprises about 42.01 % of the total input costs for producing Aluminium. Hindalco uses 3 types of Energy resources to manufacture Aluminium i.e. Coal, Oil and Electricity. Out of these three, electricity has the highest share (almost 76.6 % of total energy consumption). Total cost of energy for last year was Rs. 878.21Crore, which includes Rs.146.71 Crore for Fuel oil, Rs.672.684 for Electricity, Rs.58.817 Crore for Coal & purchased steam. Last year company consumed 487447 MT of Coal, 82485KL of Fuel Oil, 59,858.08 Lakhs kWh of Electricity and 309806 MT of purchased steam. With sincere efforts in the direction of Energy Efficiency by the company there has been significant reduction in the consumption of energy as given in the summary sheet. Graphical representation of few areas is attached below: -

Specific Energy Consumption (Thermal) Trends



Specific Energy Consumption (Electrical Trends)

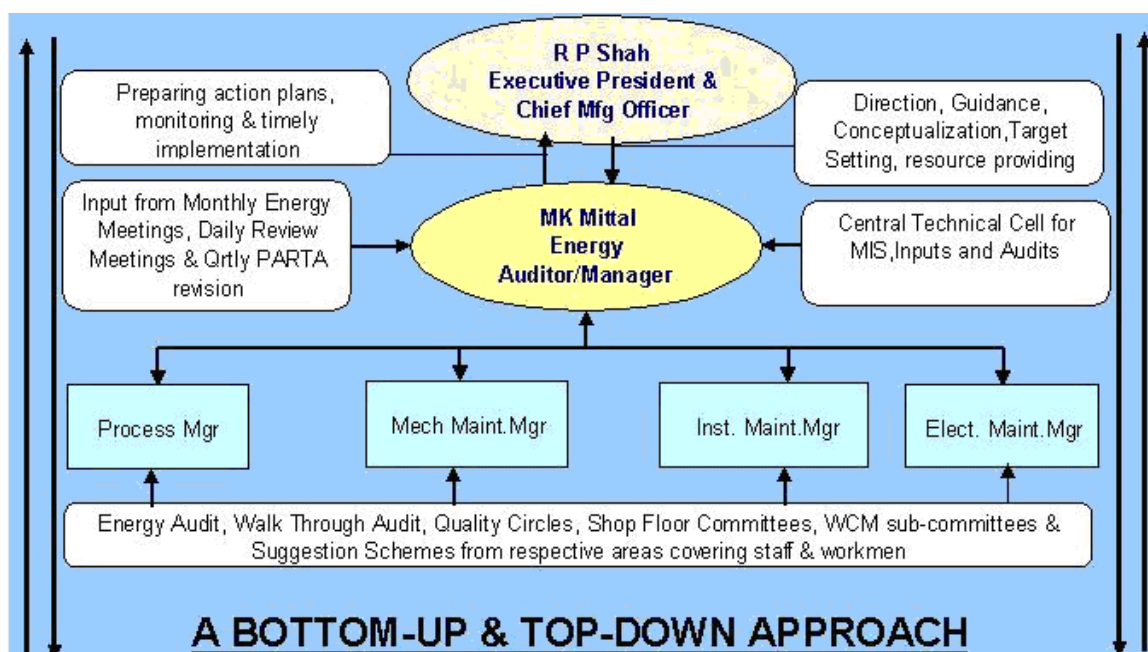


ENERGY CONSERVATION : COMMITMENT, POLICY & SET UP

In the present scenario of increasing cost trend towards Energy, Hindalco's well-established Energy Management System is continuously working on Energy conservation. The company has a well-defined Energy Policy to underscore its commitment towards Energy Conservation. A copy of the Energy Policy issued by Chief Officer – Operations (Aluminium & Power) is enclosed. To inculcate awareness on the importance of Energy Conservation not only to the employees of the company but also to the society, the following setup is followed.

- Setting up a dedicated Energy Cell with following agenda to enable the Company to reduce specific energy consumption on continual basis and thus becoming one of the lowest cost producers in the World.
 - To identify potential area for energy saving in consultation with department
 - To take care of latest technological developments in the field of energy conservation
 - To suggest measures for better energy efficiency for the implementation in the plants and new projects.
 - To monitor the quantum of energy saved on account of energy conservation initiatives.
- Arrange Energy awareness program & National Painting Competition for School Children.
- Arrange Energy Conservation program collaboration with IOC for Housewives on "Cooking Gas – Proper Utilization of LPG", "Saving Energy at Home".
- In-house and outside training program for staff & workmen for "Improved work practices for fuel efficient operation of Furnaces", "Fans" & "Cooling Tower".
- Company encourages continuous improvement through **small group activities** under aegis of WCM in areas of Cost reduction, energy efficiency, quality and productivity improvement.
- In line with "Energy Conservation Act -2001" the company has trained 12 engineers to acquire the certificate for "Certified Energy Manager/Auditor" awarded by BEE.
- The Company believes in all the modern techniques like TPM, Quality Circle, 5S, TQM, WCM etc. and is striving to become a World class Company in all its operations by creating awareness among employees towards energy conservation as well as resource conservation.
- The company has well-structured suggestion scheme to encourage employees to give their suggestions for energy conservation and employees are suitably rewarded for viable suggestions.
- Since the company has strong commitment towards Energy Conservation, the projects, which require investments, are normally approved. Company takes special care to allocate funds for these projects.
- A Top Down and Bottom Up approach through out the organization is maintained towards Energy Conservation. The organizational set up for the same is as below: -

ENERGY MONITORING METHODOLOGY "A well defined Energy Management Organization Structure"







ENERGY CONSERVATION ACHIEVEMENTS

The company has been receiving National Energy Conservation Awards, continuously since 1995. During 2004-2007 company has implemented 201 measures to improve Energy Efficiency (including capacity enhancement) by investing Rs. 197.05 Crore which resulted in a saving of energy worth Rs.69.25 Crore / Year and also increased production.

Year	No. of measures implemented (S.No. 16) (i)	Investment made (S.No. 16) Rs. Lakhs (ii)	Savings achieved (S.No. 16) (Rs. Lakhs/yr.) (iii)	Energy Cost S.No.9.3(I) (Rs. Lakhs/yr.) (iv)	% Saving of Energy Cost (iii/iv x 100)
2004-05	67	16,919.65	3,428.50	69,903.11	4.90
2005-06	66	1,868.27	2,707.10	86,730.05	3.12
2006-07	68	914.97	789.01	87,821.33	0.90
Total	201.00	19,702.89	6,924.61	244,454.49	2.83

MAJOR PROJECTS IMPLEMENTED DURING THE YEAR 2006-2007 ARE LISTED BELOW:

<p>Installation of efficient bigger capacity PHEs in place of smaller capacity PHEs for better recovery of heat energy from PGL in Alumina Plant.</p> <p>Steam Saved = 13951.6 MT Coal Saving @ 0.248 MT / steam = 13951.6*0.248 = 3460 MT Monetary Gain @ Rs 1083.33/ MT coal = 3460*1083.33 =Rs 37.48 Lakhs / Year Investment made = Rs 24.0 Lakhs</p>	
<p>Installed vacuum pump in place steam ejector in Barometric Condenser to reduce steam consumption in Alumina Plant.</p> <p>Steam Consumption before modification = 8520 MT / Year Steam Consumption After modification = Nil Saving in terms of Coal @ 0.248 MT/ Steam = 8520*0.248 =2112.96 MT Coal Monetary Gain @ Rs. 1083.33/ MT coal cost = 2112.96*1083.33 =Rs. 22.89 Lakhs Investment made = Rs. 5.0 Lakhs</p>	
<p>In Alumina Plant, The two Spent Liquor pumps had a common suction line from both tanks. This common suction line was unable to provide flooded suction to both the pumps. The suction line was modified in such a way that both the pumps now have flooded suction from the tanks, which has resulted in stoppage of one pump.</p> <p>Power Saving = 407876 kWh / year Monetary Gain @ Rs 1.89 / kWh = 408676*1.89/100000 = Rs 7.71 Lakhs / Year Investment made = Rs. 1.0 Lakhs</p>	
<p>In Smelter the compressed air pressure is reduced during holding time of Point feeder by modifying the circuit to save the compressed air in Pot line # 2 to 11.</p> <p>Power Consumption before modification = 27660000 kWh/Yr Power Consumption after modification = 25078000 kWh/Yr Actual Power Saving = 2582000 kWh / Yr Monetary Gain @ Rs 1.89 / kWh = Rs 48.80 Lakhs/Yr Investment made = Rs 99.42 Lakhs</p>	

Replacement of earlier installed inefficient open type impeller fan with energy efficient backward curved type impeller fan in Baking Furnace # 3 to save power.
 Power saving with this modification = 1120000 kWh / Yr
 Monetary Gain @ Rs 1.89 / kWh = Rs 21.17 Lakhs / Yr
 Investment made = Rs 5.0 Lakhs



In Pig Ingot Casting Unit, the operating parameter of furnace is optimized and arrangement made for cleaning of Recuperator to reduce fuel consumption.
 S F C before controlling operating parameter = 22 Lt/MT
 S F C after controlling operating parameter = 15 Lt/MT
 Fuel Saving = 7 Lt/MT
 Production during FY 06 – 07 = 71245 MT
 Fuel Saved = 498.715 KL
 Monetary Gain @ Rs 17786 / KL = Rs 88.7 Lakhs
 Investment Made = Nil



Revamping of 2 nos Properzi Furnaces in Fabrication Plant
 Production of EC grade re – draw rod from 2 furnaces = 18675 MT
 Production of Alloy re – draw rod from 2 furnaces = 4392 MT
 Sp.Fuel Consumption before revamping in EC Grade = 31 Lt / MT
 Sp. Fuel Consumption after revamping in EC Grade = 28 Lt / MT
 Sp.Fuel Consumption before revamping in A W Rod = 67 Lt / MT
 Sp. Fuel Consumption after revamping in A W Rod = 60 Lt / MT
 Fuel saving in EC Grade = (31 – 28)/MT = 3*18675/1000 = 56 KL
 Fuel saving in AW Rod = (67 – 60)/MT = 7*4392/1000 = 30.74 KL
 Total Fuel Saving after revamping = 56 + 30.74 = 86.74 KL / Year
 Monetary Gain @ Rs 17786 / KL = Rs 15.43 Lakhs
 Investment Made = Rs 68.5 Lakhs

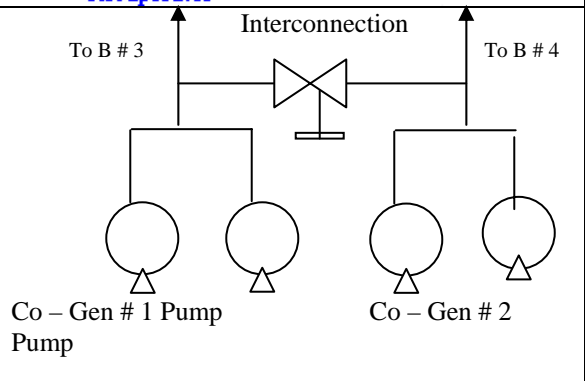


In Properzi furnaces through SOP modifications and optimizing operating parameters and provided on line cleaning facilities of recuperators 3 Lt / MT fuel saved.
 Sp.Fuel Consumption before analysis = 31 Lt / MT
 Sp. Fuel Consumption after training & improving recuperators efficiency = 28 Lt / MT
 Fuel Saving = 3 Lt / MT
 Production furnaces in FY 06 – 07 = 45931 MT
 Monetary Gain @ Rs 17786 / KL = Rs 24.5 Lakhs / Year
 Investment Made = Nil



Inspection door for on line cleaning of Recuperator

In Boiler House, inter connection of Deaerator Feed Pumps of stage # 1 & Stage # 2 in DM plant has lead to stoppage of one Deaerator pump (50 HP motor.)
 Net power consumption with one pump in service = 23.35 kW
 Extra load on another pump after interconnection of pump = 3 kW
 After interconnection, power saving = (23.35 -3) = 20.35 kW
 Net power saving / Year = 20.35*24*300 days = 146520 kWh
 Monetary Gain @ Rs 1.89 / kWh = Rs 2.77 Lakhs
 Investment Made = Rs 0.20 Lakh



In Boiler House, isolation of the pumps of Stage # 2 for Multi Grade Filter by connecting inlet of MGF to the ACW pump outlet for reducing the turbidity of the cooling water of Cooling water basin.

Power Consumption of CT Basin Pump = $30 \times 0.746 \times 2 \times 0.8$
= 35.8 kW

Extra power consumption after stopping of CT Basin Pump
= 10 kW

Actual Power Saving = $(35.8-10) \times 24 \times 310$ days = 191952 kWh

Monetary Gain @ Rs 1.89 / kWh = Rs 3.63 Lakhs / Yr

Investment Made = Rs 0.50 Lakh



In addition of above, following 57 major projects have been implemented during FY 06 – 07.

- Replaced under rated motor of Evaporation - 1 feed pump to avoid the duplicate pump running.
- Replaced under rated motor of Fine seed wash pump to avoid the duplicate pump running.
- Installation of additional smaller capacity pumps and motors to avoid the duplicate pump running leading to power savings.
- Replaced under rated motor of Additional Spent Liquor pump to avoid the duplicate pump running.
- Provision of hot condensate line for Existing growth tank air lift cleaning to save the steam energy.
- Isolation of good condensate transfer pump by utilizing the steam pressure to save the power.
- Modification in Wash Tank over flow line to stop the use of Agitator and intermediate underflow pumping.
- Installation of remote type level transmitter in place of ultrasonic level transmitter so that variable flow can be maintained according the level by varying the speed of pump
- Modification in suction of purge water pump to avoid the unnecessary running of ISC hot well pump during the shutdown of ISC unit.
- Bypassing the Old digestion bad condensate pump by utilizing the differential pressure available in between Old digestion bad condensate and New digestion bad condensate tank.
- Bypassing the use of dilution tank & transferring the overflow of washer tank # 1 to Digestion # 1 & 2 directly thus stopped the use of intermediate pumping.
- Bypassing the use of dilution tank and transferring the overflow of washer tank # 1 to Digestion # 3 & 4 directly thus stopped the use of intermediate pumping
- Utilised hot water from wash water tank for Mud cake washing by minor piping modification and stopped 250 HP motor of cloth wash pump.
- Additional spent liquor pump motor HP rationalization done from 120 HP to 150 HP to avoid duplicate running of two big 450 HP pump. Now only one 450 HP and one 150 HP motor is running.
- Reduce process bottlenecks in MPS pumps.
- Extra capacity of Main Air slide Fans is utilized in fluidization purpose of secondary discharge air slide thus stopping the Secondary Discharge Air slide fan of Fume Treatment Plant of PL # 1, 2 & 3 by suitable modification in discharge headers.
- Individual point feeder operation in Pot Line II to improve the current efficiency.
- Provision of ON/OFF switches in addition to timer in the lighting circuit of DSS platforms to reduce the ON time.
- To reduce energy consumption/Ton of Aluminium produced by reducing stub to carbon drop in Pot Line-3 by changing the stub dia.
- Installation of FRP fan in place of metallic blade in cooling towers of Reduction Plant - 2.
- Stopped the operation of enriched silo filter bag house fan by connecting the duct with main bag house duct of FTP in Pot line # 6.
- Interlocking of FTP heater of Paste Plant with the temperature of duct gas thus preventing the idle running of Heater.
- Stopped the unwanted continuous blowing of compressed air by providing the solenoid valve, timer and PLC program modification.
- Introduction of new size mould to suit the rolling requirement to reduce the generation of process scrap thus saving the fuel oil and melt loss.
- Installation of 18 watt CFL in place of incandescent bulbs in worker toilets of Pot line - 4 to 11.
- Reduction in idle running of fan motor of Air conditioning through modification in control circuit of compressor house airflow control room.
- Reduction in idle running of exhaust fan motor of dross press through modification in control circuit.
- Installation small PLC (Siemens Logo) in circuit of Pot line # 9 Lunch room to avoid the idle running of electrical equipments
- Elimination of wastage of Energy in anode effect signal system of pots.

- Installation of AC drives in motors of FTP fans & blower of Pot lines of PI - 2.
- Installation of AC drives in ID & FD fans of Cast house & Billet Casting Furnaces to save power.
- Modification in duct of Baking furnace # 3 ID fan to avoid the unwanted stoppage of firing thus saving the unwanted cooling of furnace during duct cleaning.
- Stoppage of unwanted air flow by providing solenoid valve in main air supply line of Rieco conveying system to reduce compressed air consumption in Paste Plant.
- Reduction in point feeder air header pressure to 4.0 Kg/Sq Cm from 5.2 Kg/Sq Cm in Pot line 1 to 3 to reduce the compressed air consumption.
- Installation pressure regulating valve in point feeder header of Potroom Plant-2 to optimize the header pressure.
- Modification in power supply circuit of Baking furnace # 4 sections so that separate supply control can be made for each fire group rather than complete section to reduce the outage of fire cycle thus reducing the unwanted cooling of furnace.
- Modification in filter dust transfer route of bag houses of Paste plant to avoid the running of Old Ball Mill.
- Modification in filter bowl of Slab Casting to reduce the scrap generation.
- Clubbing of alloy ingot order of two months and casting accordingly to reduce the scrap generation.
- Modification in discharge chute of Paste Plant conveyor to avoid the reprocessing paste mixer.
- Replacement of pulsing header of pot line # 4 DSS from 3" to 8" to reduce the header pressure loss thus saving the compressed air consumption.
- Removal of Bag filter fan of Pot line # 2 alumina silo of 100 MT capacity by connecting the duct with main FTP bag house duct.
- Reduction in steam consumption at Paste Plant through elimination of joints.
- In Davy Cold Mill, Aux hydraulic system was driven by 3 no. of 30 kW pump motors. But after modification this system is driven by only 2 nos. of pump motors. Which is led to energy saving.
- In Press area 250W, 10 Nos. of lights are glowing continuously throughout the day, To prevent this a limit switch will be introduced in circuit so that It will switch on only when it is needed.
- In Annealing Furnaces, Change in the practices of foil stack material for silvassa, which causes a energy saving of 8 kWh/MT
- Aging Cycle of 6063 alloy reduced by 1.0 Hr, from 188degC for 6.0 Hrs to 190 deg. C for 5.0 Hrs. which has led to a remarkable energy saving.
- Aging Cycle of Mixed alloys reduced by 1.0 Hr from 186degC for 8.0 Hrs to 190 deg. C for 7.0 Hrs which has led to a remarkable energy saving.
- Stage # 1 DM plant Degasser water pump replacement by energy efficient pump
- Blow down of Boiler reduced due to addition of chemicals at water supply.
- Connect the soot blower steam drain line to CBD flash tank to reduce the auxiliary steam consumption
- Provided door limit switch in Co-Gen. Stage -1 TG MCC, UPS, Battery and Switch gear room
- Recycling of Effluent water of Ash plant in Boiler House.
- Recycling of Condensate water to process after heat recovery in Boiler Heat Exchanger
- Installation of ON Line Heat Exchanger cleaning (acid shooting) system in Boiler area
- Reduction of Compressed Air Header Pressure 6.0 Kg from 6.5 Kg in Boiler House to save power.
- Trial Time reduction of D G Set in Boiler House from 30 to 10 Minutes by providing Battery Charger.
- Providing the LOGO (PLC) in Air-conditioning unit of old and new Training Centre.
- Reduced running time of 4 Nos Roof Ventilator fans in Work Shop.

Besides above, a number of energy conservation projects have been completed through **Small Group Activities**; only some of these have been included above.

ENERGY CONSERVATION PLANS AND TARGETS

Energy conservation measures (planned)	Anticipated Savings in Rs. Lakhs	Approx. Investment (Rs. lakhs)	Project commencement and completion year
Alumina Plant			
1 To convert existing high temp. Digestion technology with energy efficient double digestion technology	967.25	11885	2007-08
2 Evaporation Unit # 3 Feed Pumps: Replacement of 150 HP motors by 200 HP motors to avoid duplicate equipment running.	3.754	3.0	2007-08

3	Evaporation Unit # 3 Homo Liquor Pumps: Replacement of 150 HP motors by 200 HP motors to avoid duplicate equipment running.	4.178	3.0	2007-08
4	Construction of drain channels to connect all individual sump pit in filtration area. This will avoid individual running of sump pumps and will save power.	2.284	0.75	2007-08
5	Sequencing of Evap unit II and III for increasing evaporation rate on account of reduced BPR and stopping one pumping station and power saving.	94.281	2.5	2007-08
Reduction Plant				
1	Reduce energy consumption by using bigger size cathode blocks in electrolytic pot	0.081 Lakh / Pot	0.4 Lakh / Pot	2007-08
2	To reduce oil consumption by improving flue design	To be assessed after trials		2007-08
3	Modification in Oil Heating Unit of Slab Casting Furnaces.	2.87	0.3	2007-08
4	Installation of Variable Frequency Drives for I D Fans of Alumina Conveying Plant 1 to 2.	16.07	23	2007-08
5	Installation of VFD in Pot Air Slide motor to control the speed of motor with PID loop of pressure transmitter to get the constant pressure.	8.51	11	2007-08
6	Installation of VFD in main Air Slide motor to control the speed of motor with PID loop of pressure transmitter to get the constant pressure.	12.29	25	2007-08
7	2 nos. energy efficient backward curved type fans to be installed against the existing inefficient open type impeller fans in Bake Furnace # 2 & # 3	15.12	10	2007-08
8	To replace convectional bulbs of 200 Watt in Toilets of Pot Line 4 – 11 with 28 Watt tube lights.	1.02	0.21	2007-08
Fabrication Plant				
1	Revamping of 3 Nos of Soaking Pits. (1) Energy saving by not using Homogenizing furnace will be 924500 kWh/Year. (2) Energy saving by Improved insulation will be 631440 kWh/Year.	29.41	135.00	2007-08
2	Revamping of Homo furnace. By which the power consumption will reduce from 350 kWh/MT to 300 kWh/MT.	2.37	63.00	2007-08
3	By providing software interlocking system in Solution Furnace to reduce idle running of fans.	0.20	0.00	2007-08
4	In caster, The 2 Nos of pump motor will be change from 10 Hp to 3 hp Building Scrubber & Inside scrubber which will led to energy saving.	1.39	0.50	2007-08
Boiler & Co - Gen				
1	To provide Feed water heater in Co-Gen 1 to increase the feed water temp. thus saving in coal	18.90	15.60	2007-08
2	To circulate the CEP water through the Gland Steam Condenser to increase the feed water temp thus saving in coal	9.98	2.50	2007-08
3	To provide air pressure regulating valve in the plant air line to reduce the consumption in ash plant thus loading on compressor is reduced	5.34	0.50	2007-08

4	To install Variable Frequency Drive in the FD Fan motor of Co-Gen 1	18.54	48.44	2007-08
5	To install Variable Frequency Drive in the FD Fan motor of Co-Gen 2	10.12	21.43	2007-08
Rectifier Station				
1	Stopping the A/C cooling tower pumps by providing water supply from main cooling tower for Potline#9,10&11 S/H Air-conditioning unit.	0.84	0.00	2007-08
Services				
1	To reduce skin radiation losses by changing refractory material in Billet and Slab Cast house Furnaces.	7.77	9.50	2007- 08

ENVIRONMENT AND SAFETY:

We at Hindalco are totally committed to sustainable development; hence, building eco-efficiency in all of our operations and guarding natural resources come to us naturally. Our company has a well-drawn out environmental management strategy in place. Environment concerns are textured into all manufacturing processes. In order to ensure that Hindalco comply with all the stipulated environment norms, various state-of-the-art pollution control systems / devices have been installed to prevent and control pollution.

With better awareness and appreciation towards ecology and environment, the organization is continually looking for innovative and cost effective solutions to conserve natural resources and reduce wastes. Capacity increase of the existing plant by process innovation, equipment modernizations etc with insignificant increase of pollution load are some of the methodologies that highlight the strategies adopted at Hindalco.

Our company has a state-of-the-art automated industrial & domestic effluent treatment plant to treat the effluent generated by the plants and colony. The treated effluent and treated domestic water is recycled back for use in plant process. The company is striving to attain zero effluent discharge status in all respects.

Updated fuel-efficient and particulate matter reduction technology (advanced ESP's) have been installed in our Calciners and Boilers with Co-generation facilities. Microprocessor based controls and Advance Dry Scrubbing System installed in all our Pot Lines to ensure less emission and energy.

In order to keep pace with the changing norms and ensure compliance with statutory requirements in the field of pollution control, retrofitting and upgradation of pollution monitoring and control facilities in its existing facilities are a part of Hindalco's proactiveness. It is important to mention that such modifications/retrofit programs not only help in betterment of environment but also ensures resource conservation. To highlight some of the initiatives are raising stack height of our Billet Casting & Cast House areas and also retrofitting one Baking Furnace with advanced Fume Treatment Plant shows commitment towards pollution prevention.

Hindalco's strength lies in handling and utilization of all its solid wastes in environment friendly ways. Hindalco was the first company to introduce dry stacking of Red Mud. It also pioneered the recycling of Spent Pot Lining to produce cryolite for its internal consumption requirements and use the carbon residue as fuel in the boilers. All the ETP sludge is used as soil conditioner in project "Sanjeevani". The plantation area developed over old Red Mud disposal sites is like a forest cover and is a pilgrimage site for environmentalists to see how waste land can be transformed into a green land. STP sludge is used as manure in the company's horticulture activities. Switching over to dry disposal of Fly Ash have resulted in maximum ash utilisation for productive use. A substantial amount is given to cement manufacturers; some is used to produce bricks, construction work and the rest in raising the dyke around the ash pond at Renuagar.

Hindalco is reclaiming its old ash disposal area through plantation plants and converted this site into a lush green environment. It is also note worthy to mention that the Company is able to dispose all the fly ash at Renukoot and some of the old stock lying is also being given away.

We have integrated all three management systems of Quality (ISO-9001), Environment (ISO-14001) and Health & Safety (OHSAS-18001) to achieve total business excellence. To ensure our company's on-going conformity to integrated management systems, auditing is an inbuilt process. We track our performance against detailed environmental matrix, engaging professional environmental audit consultants and with our own internal audit team which includes many certified auditors conduct in-depth environmental audit. Det Norske Veritas, the certifying agency conduct biannual surveillance audits. Audit reports reconfirm the fact that we are environmentally sound. Hindalco has proactively complied with "Corporate Responsibility for Environment Protection" requirements of MoEF.

A full-fledged Environment Management Cell with qualified personnel looks after all the environmental activities. This constantly monitors with the support of well-equipped Central lab.

The company continues to make substantive investment towards environment protection. Investment till date exceeds Rs.53779.39 Lakhs and future investment plans for Rs22941.65 Lakhs are in pipeline at Renukoot and Renuagar.

Hindalco is fully conscious about its obligation to its stakeholders and will continue in its march to produce metal in an environment friendly manner.

A few significant achievements in respect of environment are as follows:

1. Segregation and stacking of scrap and waste material in disposal area and recycling of various materials resulting in extra-earning of about Rs. 6.00 crore per annum.
2. 100% of the total ash generated is being supplied to cement industries hence utilization of waste material for productive use and a major portion of the remaining ash is also lifted by users. We at Hindalco utilized ash in plantation projects, construction and land filling.
3. From the Effluent Treatment Plant, the sludge generated after treating effluents is 100 % utilized as soil conditioner in the Red Mud Plantation project.
4. Spent Pot Lining generated from the Smelter is taken to the Cryolite Recovery Plant where the fluorine values are recovered to make cryolite an useful raw material required in the smelter and the carbon residue is burnt off in the boilers to utilize its Calorific Value. Hence there is no waste disposal on this account.
5. All slab areas in Alumina Plant provided with geo-membrane lining to prevent seepage.
6. One extra field provided in ESP of boiler # 1 to bring down SPM emission to less than 100 mg/Nm³ from the present value of 135 – 140 mg/Nm³.
7. Made boiler & co-generation unit zero industrial water discharge plant by doing different modifications for recycling of water within the plants.
8. Upgraded ETP to achieve process water quality standards for total recycle.
9. Commissioned the Fume Treatment Plant in Baking Furnace No.5 to arrest emissions.
10. Hindalco was the first to start dry stacking of Red Mud, which helps to prevent run-offs, seepage and use less space to store.
11. Green house Gas emissions reduced by 20.49 % in the last 15 years.
12. Treated water from Upgraded STP reused in Horticulture and process.
13. Baking Furnace # 4 is retrofitted with FTP to reduce emission.

The prestigious International Aluminium Institute (IAI) has adjudged the Company as the best in Safety in the world for Alumina Plant in 1999-00 and for Smelter plant in 2000.

The company depicted by the following awards.

- Greentech Silver Environment Excellence Award – 2006
- Gold Innovation Safety award 2006 from Institution of Engineers (India).
- Greentech Silver Award for Safety Management & Performance – 2005.
- Best safety performance plant award 2005 from International Aluminium Association of India
- National Safety Award (Winner) by Ministry of Labour - 2005.
- National Safety Award (Winner) by Ministry of Labour - 2003.
- Greentech Gold Medal for Safety Management & Performance – 2003
- Received "Yogyata Praman Patra" from National Safety Council for the year 1999
- Mines – Reclamation / Rehabilitation / Afforestation Award, 1999

Whether any dispute pertaining to statutory requirements of safety and pollution control is pending with any Government Agency. If Yes, give details:

No.