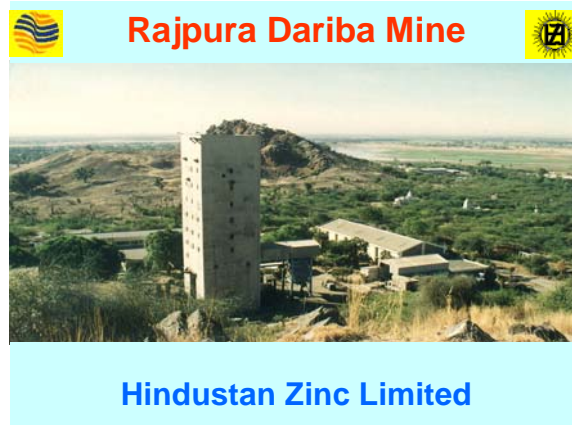


A brief write up about the unit



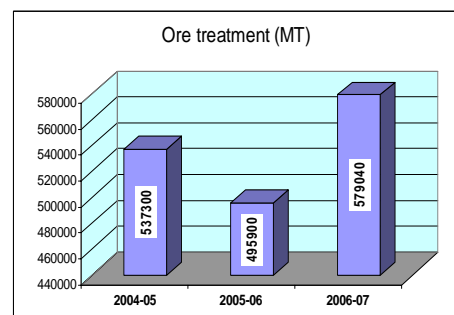
(i) Unit Profile –

Rajpura Dariba Mine is a mining unit of Hindustan Zinc Limited, a Vedanta group company. The unit is engaged in **underground mining and beneficiation** of Lead (Galena) & Zinc (Sphalerite) ore to produce Lead & Zinc concentrates for smelting. The unit is a certified Integrated Management System EHSQ Unit for ISO 14001: 2004 ; ISO 9001:2000 ; ISO 18001:1999. Rajpura-Dariba Mine is located at the southern extremity of Rajpura-Dariba-Bethumni metallogenic belt in Rajsamand District, Rajasthan, at a distance of 76 KM NNE of Udaipur. The mining activity is below the surface level or it is an underground mines. This mine perhaps represents the oldest mining and smelting operations in the world for the extraction of zinc metal. Old wood, bamboos have been carbon dated to 2100 -2500 years BP.

Mining – The mine was commissioned in April 1983. Access to the mine is through a main and an auxiliary shaft. Both the shafts are used for men / material winding. Horizontal Flat – back Cut and Fill method was employed for extraction of ore above 300 mRL of South Lode. Vertical Crater Retreat mining method is being used below 300 mRL. The voids created by stoping are back filled by cemented fill to provide support to the walls. In addition other reinforcements like cable bolting & supporting is also done. Large dia holes are drilled by ITH & DTH drill machines. Main compressor is installed at surface. After blasting 3.5 m³ electric LHDs are used to load and haul the broken ore upto the nearest ore pass which opens at a track facilitated haulage drive. Electric locomotives pull a train of 5 t Grandby cars carrying the ore up to the main ore pass. After crushing to (-) 150 mm size ore is hoisted to surface by 6 t capacity skip and conveyed to coarse ore stockpile of beneficiation plant.

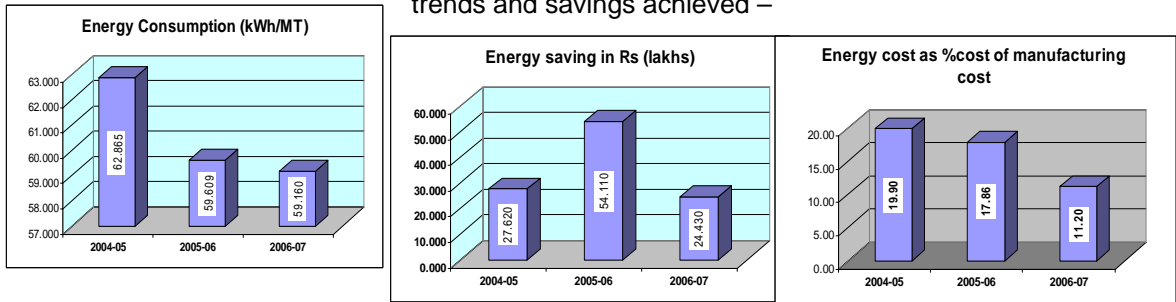


Beneficiation – Ore hoisted from underground mine is transferred to crushing plant at surface for size reduction in secondary & tertiary crushers. Then it is fed to the Ball Mills for fine wet grinding in closed loop. After cycloning in hydrocyclones the desired size slurry is fed into froth flotation cells. Lead & Zinc is separated & collected by using chemical agents and the concentrates are fed to thickeners for dewatering. Further water is filtered from slurry in filters and dry concentrate is stocked in yards. The graph below shows the mine production figures for the last three years.



(ii) Energy Consumption –

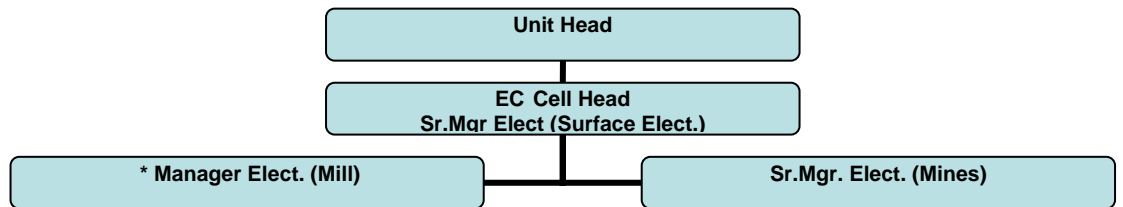
All the activities and processes use electrical energy at this unit. Thermal energy is not required in any of the activities. All the mining equipments are either electrically driven or compressed air driven. Diesel Generators are used for emergency lighting and man winding only during power cuts. Electrical energy consumption of each section and specific energy consumption of the unit is monitored on daily basis. Tables below show the energy consumption trends and savings achieved –



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

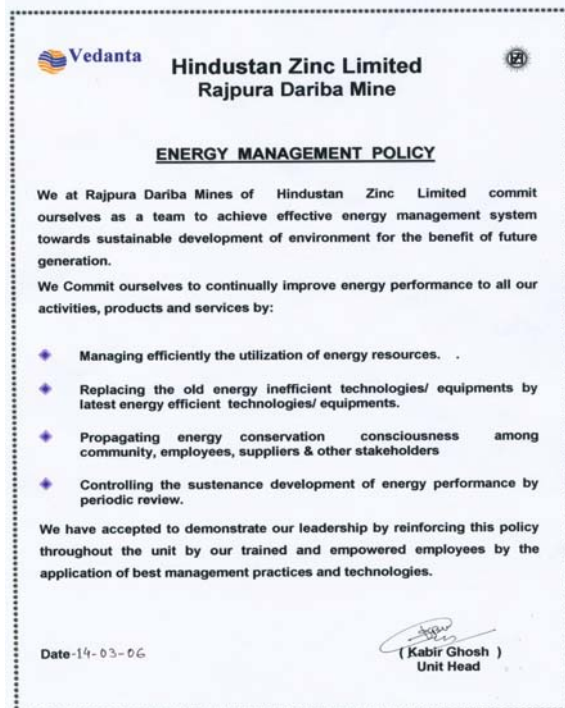
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The unit has an energy conservation policy and an organizational setup for implementing the policy. The organization structure is as shown below



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Projects are identified by all the concerned executives in production & maintenance and presented by the EC cell head. Proper budget allocation and implementation strategy is finalized three months before starting of next financial year. All the EC projects are monitored and their benefits are quantified and considered in setting the specific energy consumption targets. The energy consumption targets reflect the savings in energy consumption. A photo copy of the unit’s energy conservation policy is attached –



(iv) Energy conservation achievements –

1) Installation of RV drum filter –



The disc filter was being used for filtration of Zinc concentrate slurry resulting in high moisture (16-18 %) content in filter cake product which was difficult to transport through dumpers / trucks and consuming more diesel due to more weight of water content. The requirement of vacuum was 650 mm Hg at 100 kW and compressed air through 400 cfm screw compressor of 23 kW consumption.

This filter was replaced with Rotary Vacuum Drum filter producing filter cake of 10 % moisture at vacuum of 500mm Hg through 70 kW without compressed air. For filter cake discharge small amount of blower air is required meeting with existing Air Blower.

Cost involved – Rs 11.45 lakhs, Power saving – 2.80 lakhs units

2) VFD for series pump -



After successful trial of VFD in series pumps. New VFD installed in standby series pump for pumping waste slurry. Two pumps Vasa 200 of 90 and 110 kW were replaced by 110 kW single stage HD 150 pump. Due to isolation of one pump and controlled rpm through ultrasonic level sensor in the sump the power was reduced by 1.5 lakh units per annum

Cost involved – Rs 7.44 lakhs

Power saving – 1.50 lakhs units

3) Installation of Spot compressor –



Mining equipments are run either by electrical energy or compressed air. The compressors are situated at the surface level. Air is supplied via a large network of pipelines to the underground working sites. There is lot of losses due to leakage and pressure drop. A small compressor of 200 cfm was installed at the skip hoisting level for operation of gates and other small activities during shift changeover times and on public holidays. This resulted in stoppage of one 550HP compressor at the surface during less demand

Cost involved – Rs 3.44 lakhs Power saving – 1.0 lakh units

4) EE electronic choke tube fittings -



Lighting is required 24 hrs in few places in the plant. There have been lot of changes in the lighting system at our pump floor during last ten years. Dust / water proof electronic choke tube fittings with energy efficient T-8 lamps were installed replacing the 125 W HPMV fittings. This resulted in increased energy saving. Additional benefits were reduction in maintenance cost and improvement in lux level.

Cost involved – Rs 1.0 lakhs

Power saving – 0.20 lakh units

5) Reduction in speed of Thickener pumps –



Thickener underflow pumps are in operation round the clock. Slurry is either recycled or fed to the filters as per requirement. Valves were being throttled at the output. The motor rating was 22 kW, 1440 rpm. The motor was replaced with 960 rpm, 11 kW motor triala optimization with a VFD. Motor pulleys were changed. Now the valves are opened fully resulting in energy saving and reduction in chances of line jamming. This was done in other thickener as well.

Cost involved – Rs 2.2 lakhs

Power saving – 0.40 lakhs units

(v) Energy Conservation plans & targets –

The company has drawn ambitious plans for energy conservation. A continuous improvement approach is being taken. Energy consumption targets for the next two years have been decided. The major projects to be taken up during the coming two financial years have been decided and preliminary work is being done for those projects.

Year	Electrical (kWh / MT)			Reduction over the year 2006-07
	Ore production	Ore treatment	Total	Electrical %
2006-07 (Base Year)	19.78	39.42	59.20	-
2007-08	15.62	37.97#	53.59	9.48
2008-09	15.00	36.50	51.50	3.90

#For the first half of 2007-08 the specific energy consumption is 37.42kWh/MT of OT.

Anticipated money savings at the end of 2008-09 = Rs.295 lakhs/year.(@Rs 4.25/kWh)

(vi) **Environment & Safety**

Safety – Safety is an important aspect of working culture at RD mines. The company has announced its safety policy which is implemented by safety department across the mines. The unit has vocational training centre managed by officer in charge to maintain safety standards and ensure safety regulations of DGMS (Director General of Mines Safety) are being followed strictly. Each production department has separate safety officers. The culture of safety is promoted by conducting various awareness programs, onsite training, demonstration, workshops, mock drills, competitions and rewards to make people conscious of safety aspects, use of PPEs and use of fire fighting equipments. The company has also prepared its disaster management plan to handle any accidental circumstances. The unit also runs an occupational health centre in the campus for health and welfare of employees and families. The company has released environment, occupational health, safety, security and community policy in compliance with **ISO 14001, OHSAS 18001**.

Environment – The unit manages its operations to avoid environmental harm and minimize environmental impact. This is fundamental to the long-term viability of our business. The unit has ISO 14001 certification for environment management system. There are programs and systems in place to monitor and address issues like air quality, water quality and tailings management. The stack emission and dust emission are constantly monitored and controlled. The unit has planted 63450 plants in the entire campus to make the surrounding area green. The unit was winner in reclamation, rehabilitation, air pollution control measures and plantation and runner in noise, vibration control, aesthetic beauty and community development in VI th Mine Environment & Mineral Conservation week 2005 conducted by IBM (Indian Bureau of Mines)