ThyssenKrupp Electrical Steel India Private Limited

At Post - Gonde, Village - Wadivarhe, Tal - Igatpuri, Dist - Nashik, Maharashtra

1. COMPANY PROFILE

ThyssenKrupp Electrical Steel India Private Limited, a wholly owned subsidiary of ThyssenKrupp Steel, Duisburg, Germany, was formed to bring latest technology of Electrical Steel to the Asian sub continent in September 2000.

Electrical steel - a modern strategic steel product of national importance for electrical systems - is our core business.

We produce and supply, PowerCore grain-oriented and non-oriented electrical steel produced in India as well as in our electrical steel manufacturing group companies in Germany, Italy and France.
In India, ThyssenKrupp Electrical Steel India Private Limited is the only company offering entire range of aging free and energy conserving electrical steel for energy efficient electrical equipment.
ThyssenKrupp Steel group companies produce over 1 million tons of electrical steel and are number 1 in Europe and number 2 worldwide.

We also produce special qualities of carbon steel products to be able to offer our customers in Automotive, White Goods, A/C and Refrigeration, Electrical Equipment industries etc. a total package of electrical steel as well as carbon steel for different applications.

Quality and environment management systems of ISO 9001 and ISO 14000 certification, updated to latest revision, ensure our efficiency, the quality of our products outperforming national and international standards and a responsible treatment of environmental issues.

Complete R&D infrastructure and a team of Application Engineering experts make ThyssenKrupp Electrical Steel India Private Limited a solution provider. We provide optimum solutions by offering specific grade for specific application and thereby reducing the global cost by avoiding over engineering.
The continuous feedback by our Sales and Application Team enable us to develop tailor made products for specific applications right from fractional horsepower motors to very large capacity motors and generators.

ThyssenKrupp Electrical Steel India Private Limited is a market leader in India and enjoys long term trust and business association of all our customers in India as well as worldwide.

2. How Electrical steel helps in achieving energy efficiency of Electrical machines and also reduces impact on environment: -

Energy Efficient Electrical Devices: -

A law in physics says that all equipment waste energy in the form of heat and it can cause more than just wasted energy rupees. It can dramatically reduce the profitability and productivity.

Electrical machines (Static and rotating) produce heat because of the resistance of the iron core to induce eddy currents; this represents an energy loss to the system, as heat is a form of energy. Such type of loss can be minimized by using proper CRNGO Electrical steel for the Core material. The Efficiency of the Electrical machines can be further improved by using Superior Electrical steel grades (Low Core loss and High Permeability).

Substantial scope exists in India to improve energy efficiency of small motors used for agricultural pump sets, table and ceiling fans, Air coolers etc. It is estimated that, average efficiency of these appliances can be increased by 5 to 7% by using appropriate quality core material and conducting materials. Published reports indicate that nearly 40 billion kWh/ year can be saved in India by use of Energy Efficient Motors. Out of this about 20% i.e. 8 billion kWh / year may be the power saving potential due to reduction of no load losses, which is possible by the use of appropriate quality CRNGO Steel. The nation thus saves Rs. 3200 Crore / year.

Power saving, 8 billion kWh represents the generation capacity - 1500 MW, which will cost Rs.45-50 billion to set up.
Environment benefit:
Electromechanical Shielding: -
Shielding with CRNGO steels prevents malfunction of the apparatus and low frequency noise. The factors, which determine the shielding performance, are low induction high permeability and thickness of the material
Larger thickness and improved permeability will improve the shielding performance. Higher Silicon content, about 3% improve the low induction permeability.

Carbon dioxide emission: -
Clean environment is another major benefit for promotion of Energy Efficient devices. The benefit to environment is obtained through reduced green house gas emission. 1 MW of power generated from thermal power plant releases approximately 7000 T carbon into atmosphere each year. Such emissions can be drastically reduced by procurement of Energy Efficient motors.

3. ENERGY POLICY

TKES India Pvt. Ltd., is committed to conserve the use of Electrical Energy and Fuel

1. By using cost effective and energy efficient alternatives/ equipment and waste heat recovery methods in a planned manner.
2. Optimizing energy consumption at every stage of operation by

Effective operation and maintenance practices.
Setting energy norms for every stage of operation.
Periodic monitoring and review.
Training of employees in energy conservation practices.

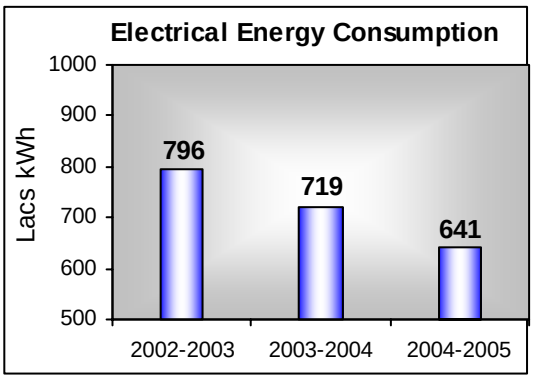
3. By benchmarking the energy consumption norms with group and other similar companies.
4. By active participation and consultation with CII and other similar institutes.
5. By carrying out regular energy audits to identify areas of improvement.
6. Sustain energy efficiency gains by establishing and maintaining a management information system designed to support managerial decision making.

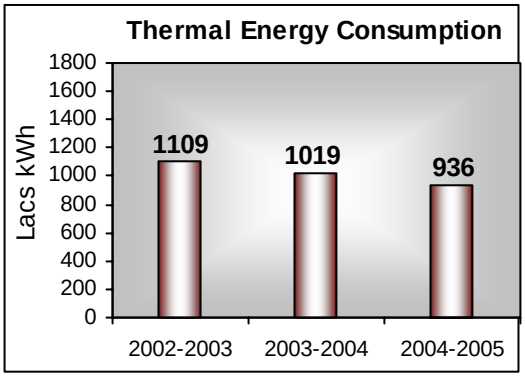
This will be achieved through dedicated teamwork, participation and commitment from employees at all levels and ensured by ENCON core group.

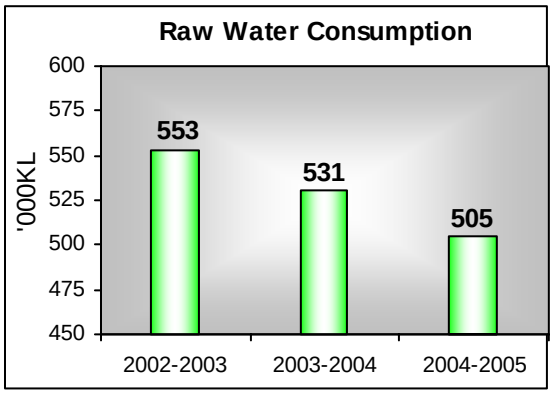
4. ENERGY CONSUMPTION

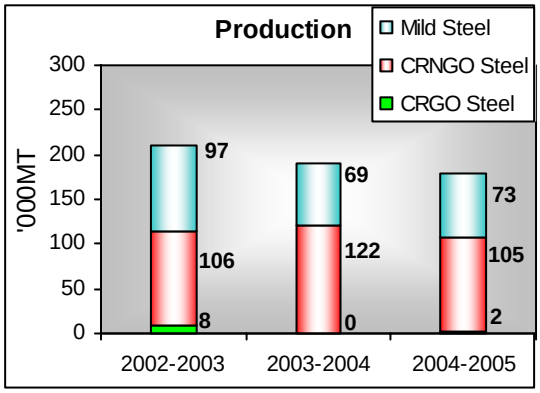
DESCRIPTION	UNIT	2002-2003	2003-2004	2004-2005 up to Aug-05
Annual Steel Production	MT	211008	191129	180000
Total Electricity consumed	Lacs kWh	796	719	641
Total Thermal (fuel) Energy consumed	MkCal	95378	87652	80491
Total manufacturing cost	Lacs Rs.	8211	7213	7406
Total energy cost	Lacs Rs.	4137	3550	3729
Energy cost as a % of manufacturing cost	%	51.38	48.28	50.98
Specific Energy Consumption - Electrical	kWh / MT	377	376	356
Specific Energy Consumption - Thermal	MkCal / MT	0.452	0.458	0.447

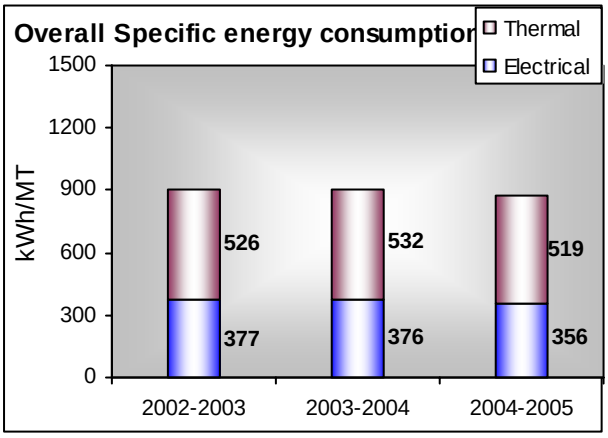
5. TRENDS – Electrical, Thermal Energy, Raw Water Consumption, Production, Overall SEC, SEC-CRNGO

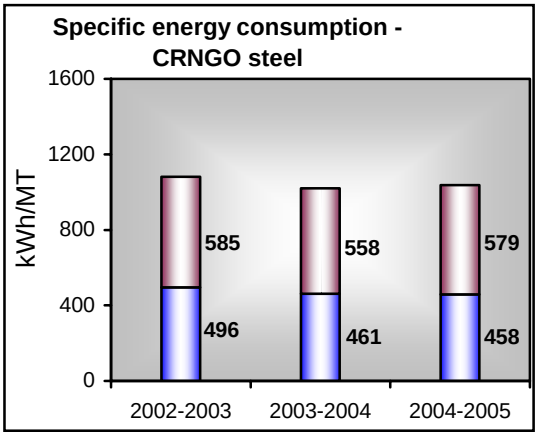












Increase in SEC of cold rolled non grain oriented (CRNGO) silicon steel in 2004-05 is due to change in product mix i.e increase in medium and high silicon production by 22% as against 2003-04. Power consumption norms for medium & high silicon production is higher as shown below.

Product at TADL	Thermal	Electrical	Product Mix (%)	
Non grain oriented silicon steel	LPG Kg/MT	kWh/MT	Year 03-04	Year 04-05
Low silicon (less 1.3%) (L)	20	259	55	33
Medium silicon (1.3 to 1.8%) (M)	21	275	35	51
High silicon (2.4 to 3.2%) (H)	27	325	10	16

Note :- Graph for year 2004-05 is from Oct-04 to Aug-05 (11 months)

7. ENERGY CONSERVATION ACHIEVEMENT / ACTIVITIES

1) TKES india has received Second Prize in Maharashtra State Level Award for Excellance in Energy Conservation & Management - 2004 by MEDA
2) TKES has been honoured by Nashik Jilha Parishad for excellence in energy conservation on the eve of Rajiv Gandhi Akshay Urja Day in Aug-05.
3) During 2004-05 with energy conservation measure, TKES has saved amount to tune of Rs. 188 Lacs.
4) TKES india had arranged plant visit and energy conservation training to school, college students (100 students) from nearby areas under BEE's National campaign to promote the energy efficieny in the country.

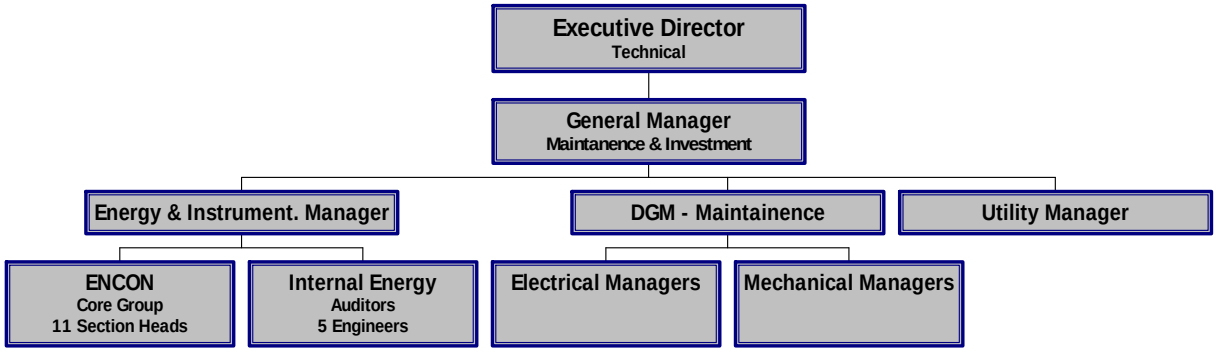
Name	No.of Students	Period
New Era School	**60**	Aug-05
NDMVP Engg. Colledge	**40**	Sep-05

Further 150 students plant visit is planned in this year.
5) TKES has organised for employees the Suggestion, Poster and Quiz competition on energy conservation on the eve of Rajiv Gandhi Akshay Urja Day in Aug-05 and given cash prize to the winners.
6) Extensive energy conservation training to staff & workmen by trained trainers from various department from year 2003 to 2005

No. of employees trained	No.of hours	Faculty
302	1234	Internal
53	568	External
27	54	External (New energy conservation products)

8.

ORGANIZATION STRUCTURE OF ENERGY MANAGEMENT CELL



9) **Major Energy Conservation projects implemented during year 04-05**

1) Variable frequency drive for exhaust blower at ARP plant

Varaibal frequency drive is installed for exhaust blower for controlling vacuum at 3 mBar. Before installing the drive the vacuum is controlled by throttling the exhaust damper

Consumption before implementation with 40 to 60 % damper open -- 74 kWh

Consumption after implementation with 100% damper open -- 34 kWh

Net power saved -- 40 kWh/hr

Potential saving/annum -- Rs. 7 Lacs

Investment -- Rs. 4 Lacs
Payback period -- 7 months

Month of Implementation -- July-05

2) Downsizing of motor & pump at Naptha plant

Replaced oversized pump with correct size pump to match revised process requirements after fuel change in TADL furnace

Consumption before implementation -- 22 kWh
Consumption after implementation -- 1 kWh

Net power saved -- 21 kWh/hr

Potential saving/annum -- Rs. 6.5 Lacs

Investment -- Rs. 0.5 Lacs
Payback period -- 1 months

Month of Implementation -- July-05

3) LPG decanting at LPG plant

Complete recovery of LPG vapours from tankers is made possible with installation of vapour recovery compressor

LPG Vapour recovery per annum -- 30 MT

Potential saving/annum -- Rs. 7 Lacs
Investment -- Rs. 5 Lacs
Payback period -- 9 months
Month of Implementation -- Nov-04

4) Installation of control air system for utility air compressor

Control air ayatem is operated at the intermediate point of the compressed air system i.e. on the downstream of the receiver and upstream of the main piping distribution system. It creates storage by introducing a controlled differential pressure across an upstream receiver & itself. This storage isolates the compressor from demand side. Peaks are dealt with by using the reserve energy in storage instead of additional horsepower thus allowing the compressor to run on no-load

Consumption before implementation -- 173 kWh
Consumption after implementation -- 161 kWh
Net power saved -- 12 kWh/hr

Potential saving/annum -- Rs. 3.5 Lacs

Investment -- Rs. 7 Lacs
Payback period -- 2 years

Month of Implementation -- July-05

5) Additive for Furnace oil at Boiler

Fuel additive is an organo-metallic compound in solution in an arromatic solvent which is readily soluble in ful oil and which acts a combustion catalyst by increasing the speed of oxidisation of unburnt hycarbons during the process of heavy fuel oil combustion.

Furnace oil to steam ratio before implementation -- 82.82 Ltr/MT
Furnace oil to steam ratio after implementation -- 80.59 Ltr/MT
Net fuel saved -- 2.23 Ltr/MT
Potential saving/annum -- Rs. 7.20 Lacs
Investment -- Rs. 3.75 Lacs
Payback period -- 6 months
Month of Implementation -- Jan-05

6) Variable frequency drive for Coolant oil tank pump at Mill#2

Operation of coolant pump is optimized during Mill run and Mill stop condition. Pump is operated at 45 Hz during Mill run and 20 Hz during Mill stop condition.

Consumption before implementation in mill run condition -- 150 kWh
Consumption before implementation in mill stop condition -- 64 kWh

Consumption after implementation at 45 Hz -- 135 kWh
Consumption after implementation at 20 Hz -- 14 kWh
Net power saved -- 65 kWh/hr
Potential saving/annum -- Rs. 4.5 Lacs
Investment -- Rs. 5.7 Lacs
Payback period -- 15 months
Month of Implementation -- Aug-05

7) Compressed air saving at Mill#1 and Mill#2

Interconnection of receivers from Mill#1 and Mill#2 by laying a new 6 inch pipe line. This has stopped one no. 1000 cfm compressor at Mill#2 and operate only one no. 1000 cfm compressor at Mill#2 and one no. 2000 cfm at Mill#1.

Consumption before implementation -- 664 kWh
Consumption after implementation -- 513 kWh
Net power saved -- 151 kWh/hr
Potential saving/annum -- Rs. 13 Lacs

Investment -- Rs. 2.5 Lacs
Payback period -- 3 months
Month of Implementation -- Oct-04

8) Water leakage arrest for Hydrant network

Leakages observed in hydrant network were 1.82 Lacs KL per annum. The damaged underground pipe line was replaced with new overhead pipe line at LPG storage yard and TADL furnace.

Consumption before implementation -- 500 KL per day
Consumption after implementation -- 100 KL per day
Net water saved -- 400 KL per day
Potential saving/annum -- Rs. 4.17 Lacs
Investment -- Rs. 1.5 Lacs
Payback period -- 4 months
Month of Implementation -- Feb-05

10) Energy Conservation Plans & Targets

Energy Conservation Measures (Planned)		Anticipated savings in Rs. Lacs	Approx. investment Rs.Lacs	Project Commencement & Completion year
Cooling Tower Fan control by sensing return water temperature	Cooling tower-1&3	0.72	0.35	05-06
Use of flat belt in place of 'V' belt	Compressor	--	1	05-06
Energy efficient motors (16 nos.)	Cooling Tower -1,2,3, TADL,Picklin,Mill-I & II, TLL, ECL, ETP	1.13	4	05-06
Reduction of street light voltage at night	Street light	2.6	5	05-06
Solar water heater	Guest house	0.2	1	05-06
Saturable core reactor replacement with thyristor control	TADL	4	10	05-06
Variable speed drive at BAF (Batch annealing furnace)	Cooling tower-1	3.4	5	05-06
Efficiency improvement by Effimax system with oxygen trim	Boiler	8.8	9.3	05-06
Optimise operation of the distribution transformers	Plant	2.4	0	05-06
Improve combustion efficiency	BAF	7.08	0	05-06
Furnace oil heating	Boiler	0.67	0.3	05-06
Install VFD for feed water pump	Boiler	2.17	1	05-06
Replacing copper chokes with energy efficient electronic chokes in fluorescent lamps (100 nos.)	Plant	0.15	0.2	05-06
Improve performance of common exhaust fan	BAF	2.1	1.5	05-06
Minimise radiation loss in reactor	ARP	1.28	2	05-06
Optimise day time lighting load in shop floor (80 nos.)	Plant	0.25	1	05-06
Heat utilisation of Zone#21	TADL	14	3	05-06
Optimise power consumption of Jockey hydrant pumps	Utility	3.25	5	05-06
Reduce speed of ATS blowers by installing VFD and switching off cooling zone blowers (3nos.)	HFCL	2.55	4	05-06
Optimise the unload power	Compressor-2	4.66	8	05-06

Down sizing of pumps (COT)	Mill#1 & #2	15.84	18.5	05-06
Install steam heaters in place of electric heaters in LPG vaporizer	Utility	10.4	20	05-06
Recover available heat from common exhaust fan of zone #1,2,3	TADL	28.5	25	05-06
Providing sufficient traps on distribution lines (8 nos.)	Plant	--	1.08	05-06
Air vents at identified locations (2nos.)	Plant	--	1.67	05-06
Instantaneous hot water generator system with steam flow meter	Pickling	24.64	9.1	05-06
Automatic temperature control for dryer	Pickling	2.63	0.77	05-06
Automatic temperature control for dryer	TADL	2.63	0.77	05-06
Temperature control valve	Mill#1	0.78	0.77	05-06
Steam flow meter (2 nos.)	ECL & TADL	--	4	05-06
Pressure reducing station	ECL & TADL	--	4.5	05-06
Switching off electrical heaters during low silicon steel production	TADL	42	0	05-06
VFD for fast cool zone motors	TADL	7.17	9.75	05-06
	Total	**196**	**158**	

ENERGY POLICY

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Dr. H. Spreckelmeyer
Vice Chairman and Managing Director