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B.E.E



Green Building
Council

RASHTRIYA METAL INDUSTRIES LTD.

SARIGAM, GUJARAT

CASE STUDY

COMPREHENSIVE AUDIT WITHOUT CAPITAL INVESTMENT



Company Details

Rashtriya Metal Industries Ltd., (RMIL) their products cater to worldwide customers in Automotive, Electrical and Switchgear, Electronics, Communications, Decorative, Power Cable and , Defense Ammunitions. One of the premier producers of specialty cold rolled strips in a wide range of Copper and Copper alloys.

PROJECT SPECIFICS

Load Details

Contract Demand KVA: 6500 KVA
Connected Load: 10,500 KVA

Our Commitment

2000 KWH per Day committed.
ROI within 6 Months.

Pre-Audit Consumption as per PO

Avg. MD per Month: 3900 KVA
Monthly Consumption: 2176,000 KWH Avg.
Production: 1780 KWH/Ton

Consumption before Energy Saving Implementation - January 2024

Avg. MD per Month: 4500 KVA
Monthly Consumption: 23,27,175 KWH Avg.
Production: 1633.1 KWH/Ton

AUDIT APPROACH

- December 2023 – Analyze Energy Consumption & Monitoring, Strategy Development for Energy Saving
- January 2024 – Recommendation & Implementation, Results and Evaluation

POST-AUDIT RESULTS

Direct Comprehensive Audit Benefits

- Detailed analysis of total load with specific machine consumption.
- Reduction in total power quality & plant harmonics.
- 8.2 % of Energy Saving by Energy Efficiency Improvement.
- 7.9% reduction in KWH/Ton.
- Electrical Safety Compliance as per CEA 2010 (amended 2023).
- Reduced incidences related to machine breakdown and machine malfunctions due to poor power quality.
- 2000 Units per day saving is equivalent to 400KWP Solar installation is worth 2 Crore Investment.
- Maintenance team awareness for new technological advancements in Electrical & Energy Sector.

In-Direct Comprehensive Audit Benefits

- Additional scope of Energy Saving and exploring options to reduce energy consumption beyond the scope of audit.
- Reduction in Greenhouse emission, Yearly CO2 emission of 492 tCO2 because of Energy Conservation & Saving.
- Proactively identifying and addressing electrical hazards and fixing potential electrical issues before they become major problems can minimize operational disruptions and production downtime.
- Qualification Energy Conservation Act 2001 (amended 2022) for National Compliance.
- Qualification in Green Building Initiative in L.E.E.D and E.S.G for Global Compliances. Under "Energy & Atmosphere" Catagory (Optimization of Energy Performance 18pts).

CONTACT US



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Chembur-Govandi, Mumbai, MH, India.



ENERGY SAVING CALCULATIONS

Consumption Data						Production Data				
MONTH	RECORDED DEMAND	MONTHLY KWH UNITS	KWH per Day	Average KWH	Expansion Load KWH	TON	KWH/TON	Additional KWH/Ton	Average KWH/Ton	
Jan-24	4500	2327175	75070	75929	-	1425	1633.11	NA	1690.5	
Feb-24	4365	2226870	76789		-	1274	1747.94		1535.7	
Mar-24	4185	2136060	68905		-	1390	1536.73			
Apr-24	No Data				-	1186	-			
May-24	4500	2311785	74574		-	1451	1593.24			
Jun-24	4185	2251935	72643		-	1475	1526.74			
Jul-24	4725	2420010	78065		53515	1401	1727.34		1689.15	
Aug-24	4905	2713770	87541		170779	1601	1695.05		1588.38	
Sep-24	4950	2616705	84410		189876	1595	1640.57		1521.52	
Oct-24	4680	2430405	78400		187346	1426	1704.35		1572.97	
Nov-24	4725	2154330	69495		121080	1250	1723.46		1626.6	
Dec-24	3960	2183985	70451	70451	35382	1387	1574.61	1549.1	1574.6	

NOTE:

- OVER THE MONTHS RECORDED DEMAND HAVE INCREASED BUT KWH/TON (AVG.) IS ALMOST THE SAME.
- INSPIRE OF NEW PRODUCTION LINE HAVE CONSUMPTION OF EXTRA 180,000 KWH PER MONTH, PRODUCTION KWH/TON IS NOT INCREASED.

DAILY ESTABLISHED ENERGY SAVING

Monthly Average – Daily Consumption (Before vs After)

January & February Avg. is 75,929 KWH per Day (Before Energy Saving Implementation)

MONTH	RECORDED DEMAND	MONTHLY KWH UNITS	KWH per Day	Expansion Load	TON	KWH/TON	Average KWH
Jan-24	4500	2327175	75070	-	1425	1633.11	75929
Feb-24	4365	2226870	76789	-	1274	1747.94	

March Avg. is 68,905KWH per Day (After Energy Saving Implementation)

December Avg. is 70,451 KWH per Day

MONTH	RECORDED DEMAND	MONTHLY KWH UNITS	KWH per Day	Expansion Load	TON	KWH/TON	Average KWH
Mar-24	4185	2136060	68905	-	1390	1536.73	69678
Dec-24	3960	2183985	70451	35382	1387	1574.61	

Note - New Production line expansion started in the month of May-24, thus data from May to November Avg. KWH is not considered.

Daily KWH Saving

Before Energy Saving Implementation Daily Avg. = 75,929 KWH

After Energy Saving Implementation Daily Avg. = 69,678 KWH

Difference in Daily Avg. KWH = $75,929 - 69,678 = 6,251$ KWH per day.

Percentage Energy Saving is 8.2%

BNN Power's committed energy saving is 2000 KWH per day.

**PRODUCTION ANALYTICS & COMPARISONS****PRODUCTION ANALYSIS(Before vs After)**

January & February Avg. is 1690.5 KWH/Ton (Before Energy Saving Implementation)

MONTH	RECORDED DEMAND	MONTHLY KWH UNITS	KWH per Day	Expansion Load	TON	KWH/TON	Average KWH/Ton
Jan-24	4500	2327175	75070	-	1425	1633.11	
Feb-24	4365	2226870	76789	-	1274	1747.94	1690.5

March Avg. is 1536.73 KWH/Ton (After Energy Saving Implementation)

December Avg. is 1574.6 KWH/Ton

MONTH	RECORDED DEMAND	MONTHLY KWH UNITS	KWH per Day	Expansion Load	TON	KWH/TON	Average KWH/Ton
Mar-24	4185	2136060	68905	-	1390	1536.73	
Dec-24	3960	2183985	70451	35382	1387	1574.61	1555.6

Note - New Production line expansion started in the month of May-24, thus data from May to November Avg. KWH is not considered.

Energy Saving Calculation in KWH/Ton

Before Energy Saving Implementation per Ton Avg. = 1690.5 KWH/Ton

After Energy Saving Implementation per Ton Avg. = 1555.6 KWH/Ton

Difference in KWH/Ton = 1690.5 - 1555.6 = 134.9 KWH/Ton Energy Saving

Percentage Energy Saving is 7.9%**ELECTRICITY BILL SUMMARY**

MONTH	RECORDED DEMAND	MONTHLY KWH UNITS	KWH per day	Amount	RATE	Add Load
Jan-24	4500	2327175	75070	2,32,02,588	9.97	-
Feb-24	4365	2226870	76789	2,16,29,879	9.71	-
Mar-24	4185	2136060	68905	1,97,82,261	9.26	-
Apr-24	NO DATA					
May-24	4500	2311785	74574	2,12,08,130	9.17	-
Jun-24	4185	2251935	75065	2,06,87,284	9.19	-
Jul-24	4725	2420010	78065	2,25,06,975	9.30	53515
Aug-24	4905	2713770	87541	2,48,95,640	9.17	170779
Sep-24	4950	2616705	87224	2,41,55,541	9.23	189876
Oct-24	4680	2430405	78400	2,25,95,882	9.30	187346
Nov-24	4725	2154330	71811	2,03,66,752	9.45	121080
Dec-24	3960	2183985	70451	1,95,67,271	8.96	35382

Average Unit Rate is Rs. 9.25/-



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EXCESS CONSUMPTION AFTER NEW PRODUCTION LINE (2023 VS 2024)

PRODUCTION		UTILITY			
MONTH	Expansion Load KWH	Nuxus grinder+Compressor		Lighting Load	
	2024	2023	2024	2023	2024
January	-	77734	-	25965	-
February	-	76014	-	22470	-
March	-	72364	-	24171	-
April	-	73642	66634	17725	26019
May	-	75573	65377	18328	27588
June	-	66568	108952	19655	26340
July	53515	69501	78815	18637	25630
August	170779	65765	77012	17675	51999
September	189876	66783	95245	28070	52073
October	187346	71055	107205	22745	53254
November	121080	79351	107240	19205	47494
December	35382	76867	112022	26198	49982

Monthly Consumption Data as per RMIL Records provided to us.

PHASE II - ADDITIONAL SCOPE OF ENERGY SAVING

WITH CAPITAL INVESTMENT

Parameters	Existing	Phase II
Max. Demand	4950 KVA	4600 KVA
Max. KWH/Ton	1727	1600
Monthly Max. KWH/day	87541	83000
Saving additional scope in KWH/day	-	2000
Monthly additional saving scope @9.25 in Rs.	-	5 Lacs
Yearly additional saving scope @9.25 in Rs.	-	60 Lacs
Comprehensive Audit Pricing with capital Items Investment	-	37 Lacs
Return of Investment	-	8 Months

BNN Power is a Mumbai - India based Energy Consultant recognized as a Energy Service Company (ESCO) empaneled with Bureau of Energy Efficiency, Govt. of India, Ministry of Power, specializes in Energy Saving & Electrical Auditing Services. With 15+ years of experience in the Energy Sector we bring Value Engineering to achieve desired results for our clients.

ENERGY AUDIT FINDINGS

- Distribution & Cable Losses
- Transformer losses
- Excess harmonics & related Energy losses
- Heating losses
- Losses due to unbalanced load
- Power Factor & Reactive Power losses, fluctuations due to load variation
- High Capacity motors overheats beyond Standard range.
- Voltage Drop and fluctuations at Machines and PDBs
- Fault Identification to prevent machine breakdowns.
- Excess Electricity Billing due to unbalanced reactive power.
- Excess consumption in Air compressors due to mechanical faults & Air leakages.
- Multiple thermography hotspots which could've resulted in Fire incidences.

CONCLUSION

BNN POWER team of experts use the unique combination of daily data monitoring, Production analytics, and human expertise to bring value to its customers. This results in optimized machine lifecycle, Efficiency and improved performance. From avoiding losses & wastage of electricity to providing solutions that improve circuit efficiency and to provide total system efficiency.



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RMIL WORK ORDER TERMS FOR REFERENCE

RASHTRIYA METAL INDUSTRIES LTD.

Plot No. 3810 to 3821, 4017 to 4043 & 4050 to 4056 GIDC, Sarigam, District:- Valsad- 396155, Gujarat, India.
Phone: 0260-3502308, Fax: , Email: pur.srgm@rashtriyametal.com

WORK ORDER (DRAFT COPY)

ISO NO.: QF/00744

Vendor Code, Names & Address : 1002062 BNN POWER STATION ROAD., GOVANDI-DEONAR., MUMBAI, MUMBAI, MUMBAI-400088, Maharashtra, India.	Work Order No.: 4500003534 WO Date : 03/11/2023 Revision No.: 0 Rev. Date : Contract No.: Contract Date : Your Quotation No.: Quotation Date :
Kind Attn : E-Mail : info@bnnpower.in Contact No.: 08828334431 GST Reg No.: 27AAJFB3895R1ZI PAN No.:	Contact Person at Office / Site for Delivery : Contact No.: Email Id: pur.srgm@rashtriyametal.com PR No.: 1300004275 PO Type: ZSER Service PO
The order is placed for and on behalf of Rashtriya Metal Industries Limited our under mentioned Principal.	
INVOICE & CHALLAN TO : Rashtriya Metal Industries Ltd, Plot No. 3810 to 3821, 4017 to 4043 & 4050 to 4056 GIDC, Sarigam, District:- Valsad- 396155, Gujarat, India.	DELIVERY ADDRESS : Rashtriya Metal Industries Ltd, Plot No. 3810 to 3821, 4017 to 4043 & 4050 to 4056 GIDC, Sarigam, District:- Valsad- 396155, Gujarat, India.
Terms & Condition :	
Energy Audit as per factory act Gujarat Gov.	
Payment Terms : Advance 35%, 20% After 1st 30% saving in Electricity Bill, 20% After 2nd 30% saving in Electricity Bill (Total Saving 60%), balance 25% after 100% saving in Electricity Bill Delivery Period : 1 to 2 weeks Inspection : at our works Delivery Terms : free delivery Special Instruction : Scope 1 Energy Audit of RMIL Sarigam Plant 2 Energy Audit include All Type Energy like Electrical, Diesel & Air, 3 Energy Audit will study the Power quality , Power safety, Electrical Load analysis, Load Losses, Harmonic study, Power factor study, 4 Energy Audit will study the Air losses, Diesel Efficiency of Vehicle, 5 Energy Audit diagnosis & recommendations for Energy Saving potential without any major investment, 6 Vendor Ensure Energy saving per month Rs. 4.85 Lacs after 3 month of 1st Audit date 7 Payment Term - Advance 35%, 20% After 1st 30% saving in Electricity Bill, 20% After 2nd 30% saving in Electricity Bill (Total Saving 60%), balance 25% after 100% saving in Electricity Bill , 8 Vendor will recommend improvement as per enclosed Scope. 9 Transportation all in vendor Scope 10 Local hotel & Transportation in RMIL scope, 11 Average KWH/T - 1780 12 Average KWH per Month - 2176000 KWH 13 Average MD per Month - 3900	
Our Tax Details :	
GSTIN No. : 24AAACR3982P1ZV CIN No. : U99999MH1946PLC005378 PAN No. : AAACR3982P	User: SANJAY BHANDARI
NOTE: PLEASE PREPARE INVOICE & DELIVERY CHALLAN AS PER PO ONLY. DO NOT MIX UP MORE THAN ONE PO ITEM IN SINGLE INVOICE & DELIVERY CHALLAN.	
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