



Energy Management System (EnMS) application (Experience from the industry)

Syed Abdul Jabbar
Energy Manager



Brief Details of the Company

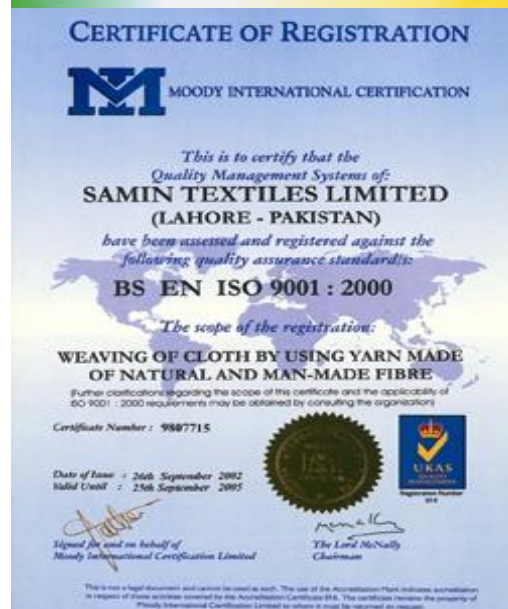
- **public limited company**
- **Average production capacity = 23 million running meters of best quality greige cloth per year or 62,500 m/day**
- **operation: three shifts a day - 360 working days per year.**
- **Machinery and equipment - imported from Japan, Belgium, Germany & Spain.**
- **From simple twills & drills SAMIN has shifted to the manufacture of specialized & Niche items such as Abrasive fabric for Industrial use**
- **Mechanical stretch items for specialized work wear**
- **Corduroy & dyed yarn fabric for the high end fashion market**
- **600 employees**
- **Exporting fabric to Europe and other countries**



CERTIFICATIONS

- ✓ **ISO-9001:2000**
- ✓ **ISO-14001**
- ✓ **Business Process Re-Engineering**
- ✓ **SA-8000:2001**
- ✓ **OKO-TEX STANDARD –100 CLASS - II**
- ✓ **Winners of Export Merit Trophy**

Future target: ISO 50001 (EnMS)





Company Energy Profile

- Average electric consumption =72,000 kWh/day
- Average steam consumption =50 tons/day
- Average gas consumption =800,000 cft/day
- Water Consumption = 400 m³/day
- Average production = 62,500 meter/day



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Energy management system





Steps for Energy Management System application

- Development of Energy Policy – **CEO commitment**
- Setting up Energy Team – **people who implement**
- Conducting Baseline Audit – **where are we now**
- Energy Efficiency Improvement Programme – **where would we like to be and when**
- Establish Energy Information and Documentation System – **performance monitoring**
- Internal Audit/ System Evaluation – **next steps of energy efficiency improvement**



Energy Policy

Mission Statement

- Ensure continuous improvement in management of energy resources through planning, implementing and monitoring projects and activities and embedding the culture of Energy Efficiency in our processes and systems.

Objectives

- Ensure all systems and procedures are aligned with Energy policy
- Improve energy intensity and avoid environmental degradation
- Embed the culture of Energy Efficiency through development of training and incentive programmes

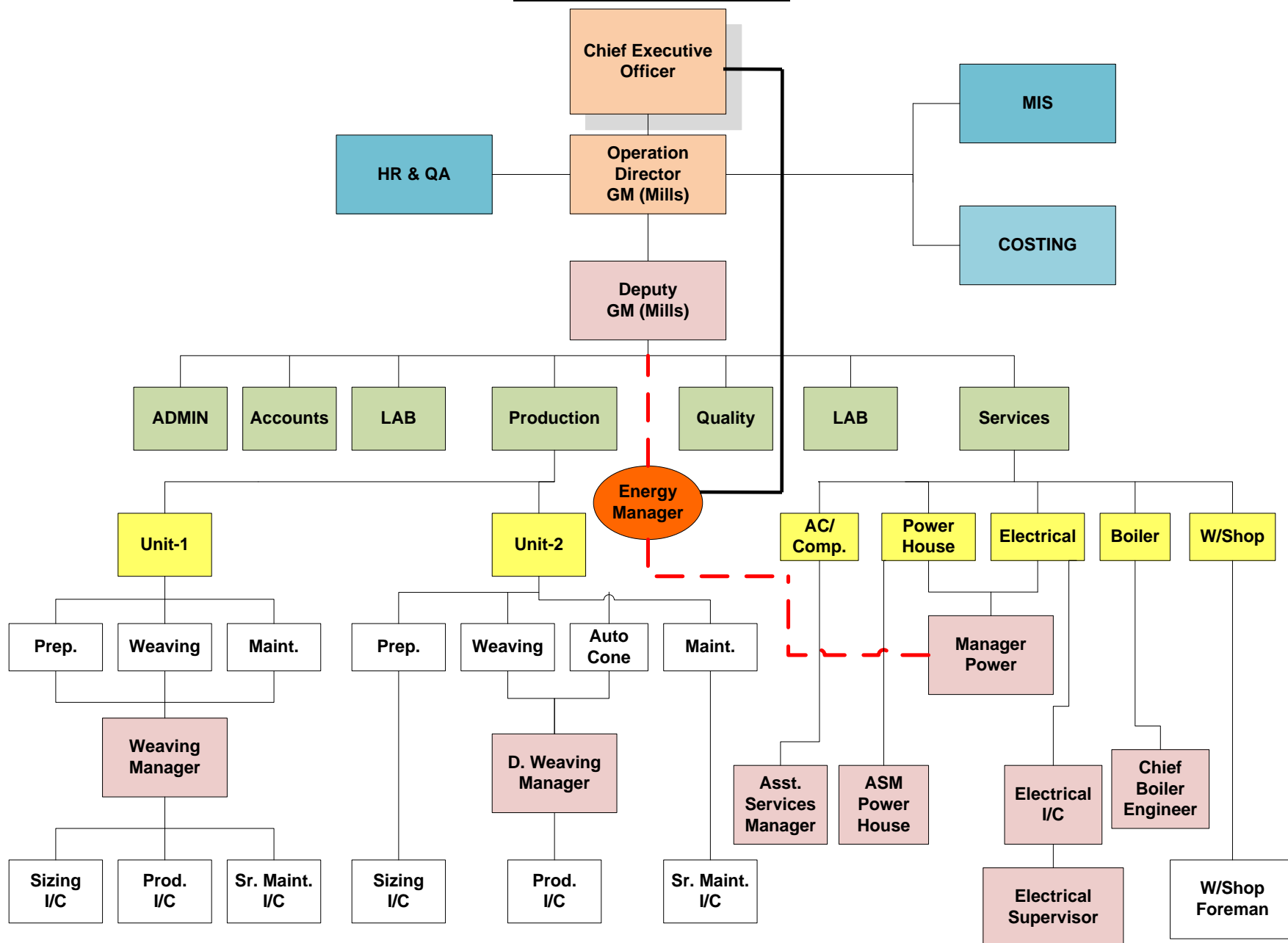


Energy Management Team

- Syed Abdul Jabbar Shah – **ENERGY MANAGER**
- Mr. Zaheer Abbas- **Energy coordinator**
- Mr. Irfan Zahid WM Unit-1
- Mr. Azeem DWM Unit-2
- Mr. Muhammad Munir Boiler Engineer
- Mr. Masood AC & Compressor
- Mr. Ghulam Mustafa Zaidi Electrical In-charge
- Mr. Usman Aslam AFM Power House
- Mr. Muhammad Imran Electric Supervisor



EnMS - ORGANIZATION





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EE Improvement Programme





Summary of 3 Steps for Improvement

Step 1: Energy management - Operation management level

--- small scale investment

cleaning, (measuring, recording,) operation tuning, minor repair, and minor remodeling

Activities are carried out by operators' own idea or ability
with advise from energy manager/engineer

Step 2: Technical improvement

---- medium-scale investment

Replacement of obsolete equipments with high efficiency equipment and introduction of energy-saving equipment

: to be completed in 2011

Step 3: Improvement requiring large-scale investment

Introduction of a new processes & technologies,
measures requiring large capital with lower rate of returns

Step 1: Implemented Measures & achieved results (small investment)

Sr.#	Main Implemented measures	Investment (Mill. PKR)	Savings (kWh/month)
1	In sizing and warping , replaced 60 watt tube lights with advance energy savers.	0.01	2,891
2	In Power House, we have converted the less loaded motors from delta to star after power analysis.	NIL	25,000
3	Improvement in blow down rate by increase in the TDS from present 1730 to 3500 ppm.	0.18	31,750
4	By making right combination we have reduced one cooling tower load in cooper compressor i.e. 11kW	NIL	8,000
5	Insulation of part of condensate return line and valves & flanges on steam lines.	0.6	16,583

Total savings: 1010 MWh/yr equal to 50,000 Euro/yr

Investment made: 6,900 Euro

Payback 1.5 months

Step 2: Implemented Measures & achieved results (Short Term investment)

Sr.#	Main Implemented measures	Investment (Million PKR)	Savings (kWh/month)
1	Detailed tuned up and maintenance of cooper compressor was done.	1.2	54,000
2	Tuned up of gas engines to increased efficiency from 31% to 35% and optimum fuel consumption.	0.045	112,833
3	Detailed tuned up and maintenance of gas engine #4 was done.	0.90	40,666
4	Inlet air temperature is reduced for compressors by using ventilation louvers.	0.02	2,083
Total savings: 2514 MWh/yr equal to 0.11 Million Euro/yr Investment: 20,000 Euro Payback: about 3 months			

Planned Measures and potential savings

(Short Term & Medium Term)

Sr.#	Key Planned measures	Investment (Million PKR)	Savings (kWh/month)
1	Installation of the flow meters for monitoring of compressed air (unit level)	1.5	35 M3/Min > 1 yr payback
2	By maintaining over head blower and using air gun	0.35	46,750
3	Using FBR blades to reduce the electric consumption of HVAC motors by 12%.	2.4	38,880 >1 yr payback
4	Epoxy paint must be applied in air ducts to reduce load on the supply fan.	3.0	14,256
5	using LED lights instead of tube rods.	8.0	100,000 > 1 yr payback

Total savings: 2398 MWh/yr equal to 0.12 Million Euro/yr
Investment planned : 0.13 Million
Payback 1.1 years

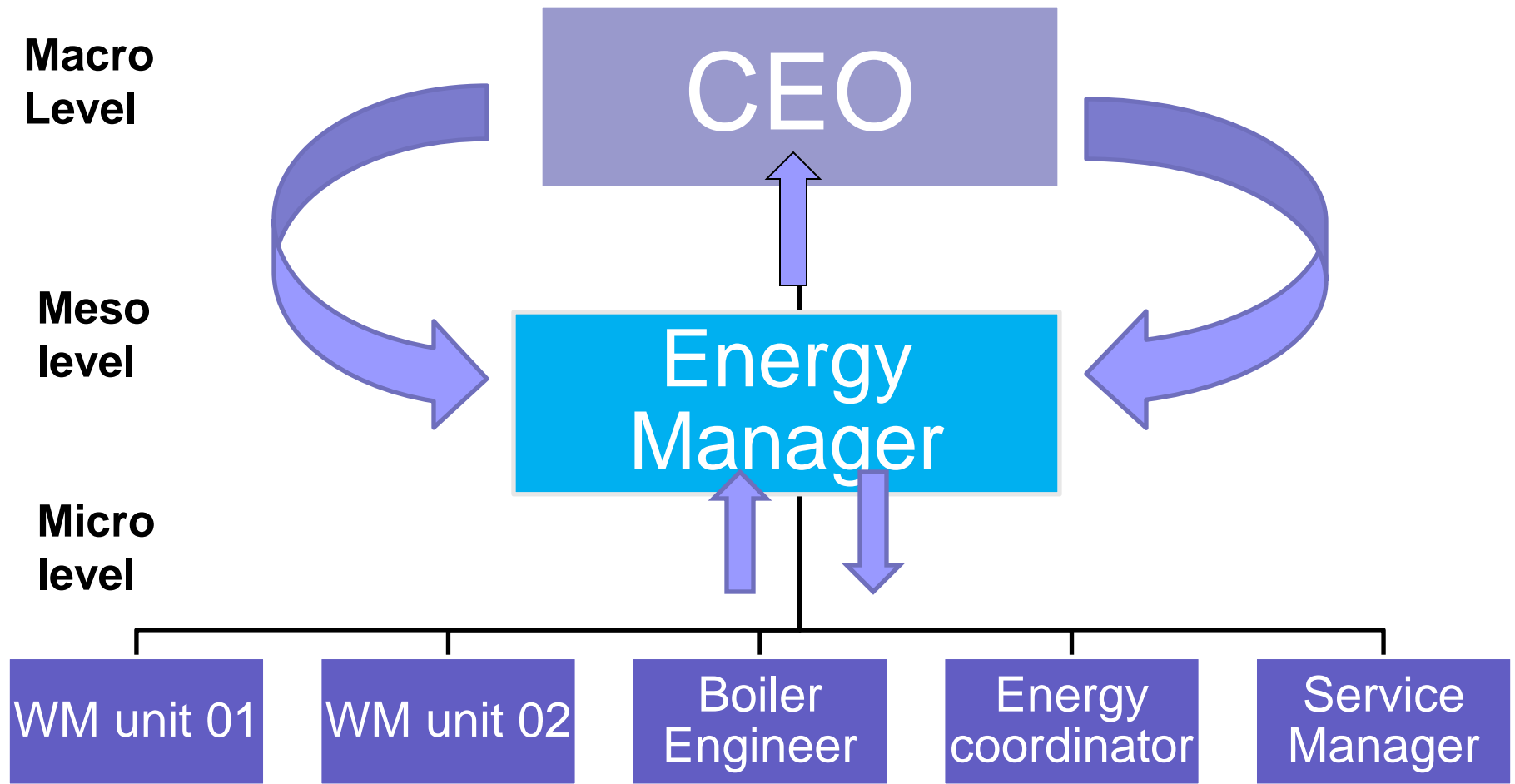
Step 3: Planned measures and potential savings

(Long Term)

Sr. #	Key Planned measures	Investment (Million PKR)	Savings (kWh/month)
1	Installation of the flow meters for monitoring of compressed air (mach. level)	8.45	Metering
2	Install Efficiency Class 1 Motors on Compressors. Benchmark: (1 time rewinding=4% loss in efficiency of motor)	9.0	45,100
3	Hot water absorption chiller can be installed on the jacket water of gas engine	25.0	108,000
4	Waste Water Treatment Plant for the recycling of the waste water.	2.20	25,000 Gallon/day
Total savings:		1837 MWh equal to 95,000 Euro/yr	
Investment planned:		0.39 Million Euro	
Payback		4 years	

Energy Information System





Energy Information Data Flow

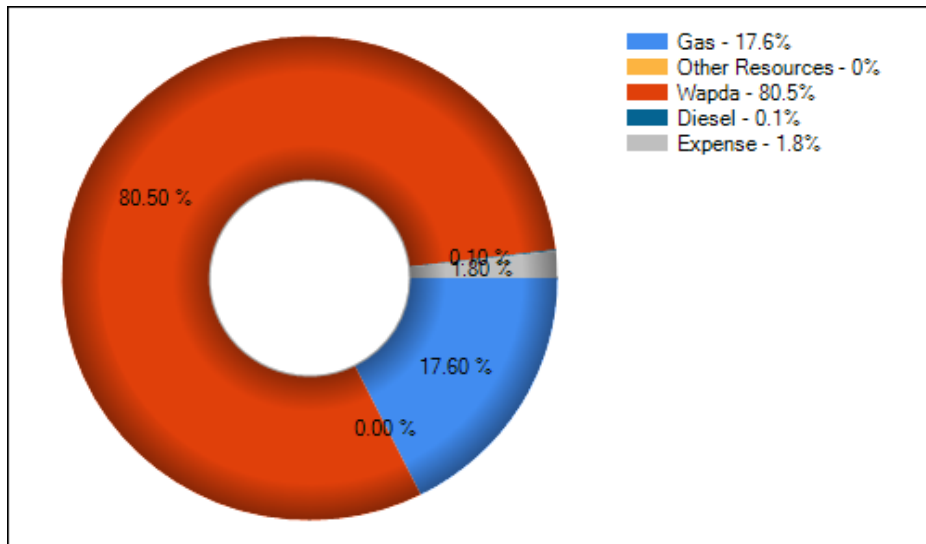


Benefits of EIS

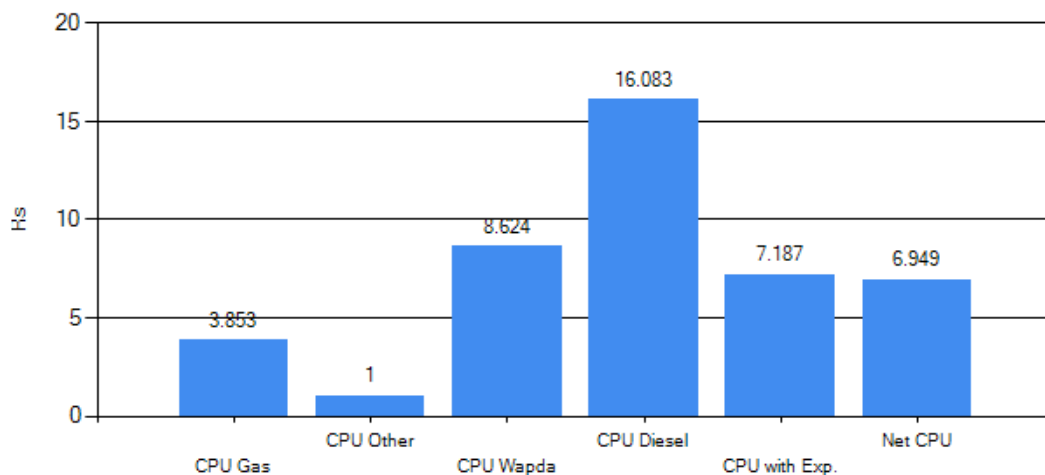
- continuous monitoring of EE performance against KPIs
– identification of corrective measures for EE improvement
- EE information to management & feedback
- identification of measures to achieve EE target for 2011
for specific energy consumption of **1.25**
- refinement of performance indicators to achieve continuous improvement



Monthly consumption of different sources for power generation for 2011

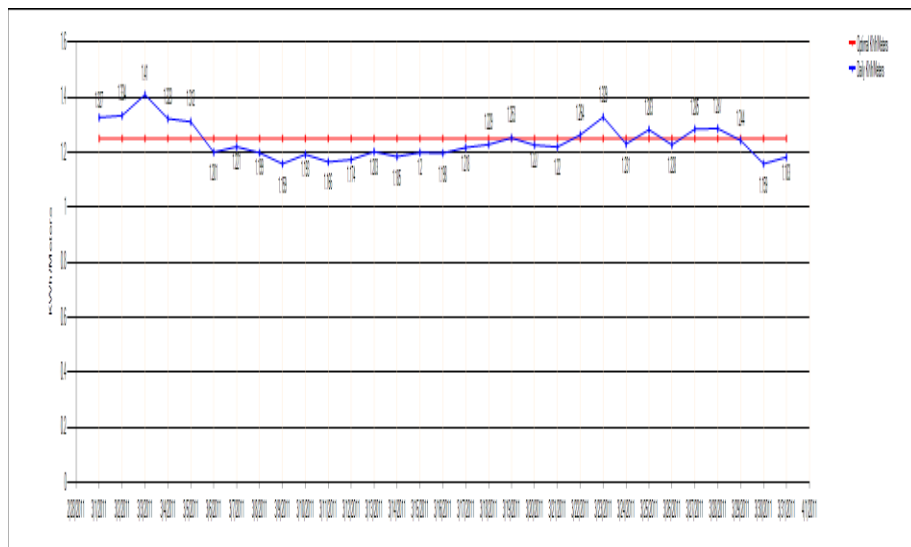


February 2011 Per unit cost of power generation

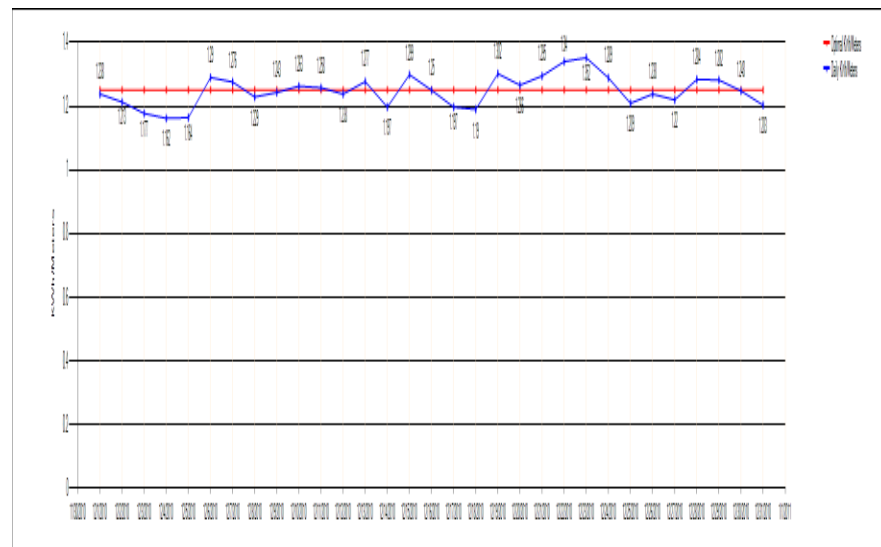


Specific energy consumption (2010, 2011)

March 2011 Report



December 2010 Report



Implemented Measures & achieved results

Internal Audit

Sr. #	Main Implemented measures	Investment (Mill. PKR)	Savings (kWh/month)
1	Optical sensors in Sizing and Installation of energy savers in both units.	0.01	2,891
2	Fine tuning of air Compressors ,leakages controlled and increased volumetric efficiency of compressors by providing ventilation louvers.	1.22	56,000
3	Reduction of 1 cooling tower and 1 circulation pump load for compressors after compressor data analysis.	NIL	8,000

Total savings: 802 MWh/yr equal to 41,000 Euro/yr
Investment made: 10,000 Euro
Payback 3 months

Overall Energy Savings achieved & Planned

Sr.#	EnMS component	Investment (Mill. Euro)	Savings (Mill. Euro/yr)	Savings (MWh/yr)
1	Baseline Audit	0.027	0.16	3524
2	EIS	0.012	0.135	2592
3	Internal Audit	0.01	0.041	802
Total		0.049 49,000	0.336 336,000	6,918

Sr.#	Planned measures	Investment (Mill. Euro)	Savings (Mill. Euro/yr)	Savings (MWh/yr)
1	Short & Medium Term	0.13	0.12	1918
2	Long Term	0.39	0.095	1837
Total		0.52	0.215	3755



Future/ planned activities

1. Develop Energy Efficiency culture through introduction of (Energy Efficiency) Employees Incentive Programme

25% of the savings will be shared for the betterment of employees at the end of every year

- Internal training on EE by Energy Manager
- Rewards programme preparation.
- Bonuses for best performers

2. Explore potential of Renewable Energy Technologies such as Solar Thermal, Solar PV, biomass
3. Identify Energy Efficient technologies for production process requirements



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THANK YOU



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