

## **ISSUE # 24**

Form1, Form2 and Form3 on Issue # 24 are attached for kind perusal. I have following comments please:

**Form1:** Some companies may have more than one distinct products. Consumption of energy of all forms Electrical, Fuel Oil, Gas etc may be separately metered and monitored for the various distinct products. Consumption of energy for these products may be sought separately and Specific consumption assessed for each of these products besides total energy consumption data.

**Form2:** Okay

**Form3:** Two additional categories of 'Area of Improvement and Modification' are proposed.

C no. 14 : Modify process to improve energy efficiency

C no. 15 : Switch over from electrical to fossil fuel or to renewable energy for cost saving

Filled in Form1, Form2 and Form3 are attached please.

**Details of the author as follows are already available with you on the web please:**

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**Certification :** Energy Auditor in 2004 ( Regn no. EA 2181 )

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**Form - 1**  
**Format for Information regarding Total Energy Consumption and Energy Consumption per Unit of Production**

Name of the company :XYZ Ltd (Automobile sector)

Full Address :-----

Contact Person :-----

Email address :-----

Telephone/ Fax numbers :-----

Plant Address :-----

A. Power and Fuel Consumption 2004/ 2005

1. Electricity

(a) Purchased

Contract demand	40,000 kW
Connected load	53547 kW
Annual consumption	179099000 kWh
Total cost	6787 Rs. Lakhs

(b) Own Generation

(i) Through diesel generator	
Annual generation	4984000 kWh
Annual diesel consumption	1514 kilo liters
Total fuel costs	322 Rs. Lakhs

(ii) Through steam turbine/generator	
Annual generation	NIL kWh
Fuel used <sup>1</sup>	NA

(iii) Through Gas Turbine	
Annual generation	NIL kWh

2. Coal quality (Gross calorific value)	NA	kCal/kg
Annual consumption	NIL	Tonnes
Total coal costs	NIL	Rs. Lakhs

3. Oil

(i) Furnace oil	
Annual consumption	12629 kilo liters
Annual costs	1431 Rs. Lakhs

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<sup>1</sup> State which type of fuel or energy was used (C = coal, B = biomass, O = oil, G = gas, E = electricity). If coal was saved state which grade i.e. C/I = imported, or C/F coal of grade F.

(ii)	Low Sulphur Heavy Stock (LSHS)		
	Annual consumption	NIL	Tonnes
	Annual costs	NIL	Rs. Lakhs
(iii)	Hot Heavy Stock (HHS)		
	Annual consumption	NIL	Tonnes
	Annual costs	NIL	Rs. Lakhs
4.	Diesel Oil		
(i)	High Speed Diesel (HSD)		
	Annual consumption	NIL	kilo liters
	Annual costs	NIL	Rs. Lakhs
(ii)	Light Diesel Oil (LDO)		
	Annual consumption	2757	kilo liters
	Annual costs	629	Rs. Lakhs
5.	Gas		
(i)	Compressed Natural Gas (CNG)		
	Gross calorific value	NIL	kCal/NM <sup>3</sup>
	Annual consumption	NA	NM <sup>3</sup>
	Annual costs	NIL	Rs. Lakhs
(ii)	Liquefied Petroleum Gases (LPG)		
	Gross calorific value	11400	kCal/kg
	Annual consumption	553	Tonnes
	Annual costs	139	Rs. Lakhs
(iii)	Piped Natural Gas (PNG)		
	Gross calorific value	NA	kCal/NM <sup>3</sup>
	Annual consumption	NIL	NM <sup>3</sup>
	Annual costs	NIL	Rs. Lakhs
6.	Biomass		
	Average moisture content, as fired	NA	%
	Average Gross calorific value, as fired	NA	kCal/kg
	Annual consumption	NIL	MT
	Annual biomass costs	NIL	Rs. Lakhs

#### B. Product mix specifications<sup>2</sup>

Product name 1: Automobiles	129489	Eq.Vehicles
Product name 2: Forging tonnage	45638	MT
Product name 3: Casting tonnage	40486	MT
Product name 4: __na_____	__na__	

<sup>2</sup> For example if you are a cement manufacturing unit producing different grades of cement, you may like to say under product name 1: OPC grade – XXX Tonnes and under product name 2: Portland slag cement– XXX Tonnes and so on.

## Form - 2

### Format for reporting status of implementation of energy conservation measures based on business plan of the company

Sl. No.	Description of measure	Category <sup>1</sup>	Investment (Rupees)	Verified savings <sup>2</sup> (Rupees)	Verified energy savings	Units <sup>3</sup>	Fuel <sup>4</sup>
1.	Install energy efficient Medium Frequency melting furnace	13	330,00,000	105,12,000	28,80,000	kWh	E
2.	Replace old clophen filled transformer by dry type low-loss transformers	9	20,00,000	2,66,000	73,000	kWh	E
3.	Install 4 Nos 30 kW Energy efficient motors in hydropack area	4	1,60,000	1,10,000	30,000	kWh	E
4.	Install 3 Nos Weishaupt burners replacing old burners	13	24,00,000	25,92,000	144	kL	O
5.	Change 35 Nos metallic blade Man-coolers to FRP blade Man-coolers	5	1,75,000	2,30,000	63,000	kWh	E
6.	Install timers for water-pumps to put off during non-working period	4	4,000	3,94,000	1,08,000	kWh	E
7.	PLC timer for exhausters in paint booth	4	4,000	2,66,000	73,000	kWh	E
8.	Modify circuits and install timers on 37 Nos power-packs of riveting machines	4	52,000	1,50,000	41,000	kWh	E
9.	Use energy saver cum softstarter / Del-star converter on presses in Forge	4	1,45,000	1,00,000	27,500	kWh	E
10.	Convert delta to star connection on under loaded motors	4	0	69,000	18,900	kWh	E
11.	Stop idle running of motors of hydraulic & auxiliaries of identified machines through timers	4	14,000	1,53,000	42,000	kWh	E
12.	Automatic closing ducts of roto-clones during non-working periods	4	50,000	5,11,000	1,40,000	kWh	E

<sup>1</sup> Use "C" number of form 3 as reference

<sup>2</sup> First year

<sup>3</sup> Use conventional energy, volume or mass units with proper prefix k = 10<sup>3</sup>, M = 10<sup>6</sup>, G = 10<sup>9</sup>

<sup>4</sup> State which type of fuel or energy was saved (C = coal, B = biomass, O = oil, G = gas, E = electricity). If coal was saved state which grade i.e. C/I = imported, or C/F coal of grade F.

13.	Develop & convert core-making to cold-box process from shell-core	14	2,10,000	15,77,000	4,32,000	kWh	E
14.	Modify to eliminate heater plate for reducing heater rating	14	0	12,78,000	3,50,000	kWh	E
15.	Install Celdek pad in ARP of Paint Shop so as to reduce rating of water pump requirement	14	8,00,000	5,33,000	1,46,000	kWh	E
16	Eliminate need for C-shift through Kaizen in Frame shop	1	0	3,18,000	87,000	kWh	E
17	Improve hearth loading by better scheduling of HT furnace	1	0	4,20,000	1,15,000	kWh	E
18	Increase output per shift and reduce shifts running in Forge	1	0	42,52,000	11,65,000	kWh	E
19	Modify pusher furnace to reduce through-put time	14	2,50,000	30,00,000	250	kL	O
20	Monitor shell temperature and Flue gas analysis and take corrective measures	2	0	18,00,000	150	kL	O
21	Modify slot furnace in line with bench-mark practice to increase furnace output of Springs	14	25,000	1,68,000	14	kL	O
22	Optimal utilization of newly installed reheating furnace in NFC	1	0	13,20,000	110	kL	O
23	Install 100 HP VFD on 3 <sup>rd</sup> pre-wash pump	4	2,80,000	11,17,000	3,05,000	kWh	E
24	Install 10HP VFD for Walking Beam in 1109 line	4	30,000	40,000	11,000	kWh	E
25	Install VFD in combustion air blower of Gogan Hardening III furnace	4	90,000	1,08,000	9	kL	O
26	Install dedicated chilling unit for Paint kitchen for optimizing temperature of common larger chilling unit	14	5,00,000	3,32,000	91,000	kWh	E
27	Install dedicated 2.2kW pump to avoid central cooling tower in c-shift	11	10,000	1,66,000	45,600	kWh	E
28	Install 5 Nos of ControlAir systems for different pcompressed air pressure requirements of different areas	6	20,00,000	21,90,000	6,00,000	kWh	E
29	Install 2 Nos of 1000 CFM energy efficient screw compressors	6	24,00,000	22,78,000	6,24,000	kWh	E
30	Modify compressed air distribution lines	6	1,00,000	2,92,000	80,000	kWh	E
31	Regular comprehensive compressed air leakage audit and corrective measures	6	0	21,90,000	6,00,000	kWh	E

32	Reduce heat loss by providing insulation on ducting and blower of LM Baking oven	7	30,000	4,48,000	1,20,000	kWh	E
33	Replace water seal plates of R/H furnace in Maxi press line	7	1,50,000	7,20,000	60	kL	O
34	Reduce chute height of Erie II furnace	7	2,00,000	17,28,000	114	kL	O
35	Volume reduction of Gogan Hardening furnace	7	2,00,000	8,64,000	72	kL	O
36	Modify and install partition arches in 4000 lb Tempering furnace	7	1,00,000	10,32,000	86	kL	O
37	Overhauling / renewing refractory of 1300 T R/H furnace	7	50,000	3,00,000	25	kL	O
38	Water trough modification to reduce heat loss through water in R/H furnaces	7	15,000	2,16,000	18	kL	O
39	Overhauling and modification of recuperator of 21' R/H furnace	8	50,000	3,00,000	25	kL	O
40	Install partition arch in Gogan Tempering-I furnace	7	25,000	5,76,000	48	kL	O
41	Improve preheating zone of Erie pusher furnace for better heat recovery of flue gases	8	2,00,000	8,64,000	72	kL	O
42	Install recuperator on Reheating furnace of NFC	8	1,50,000	6,00,000	50	kL	O
43	Use Rad-Heat tube LPG heating system to replace electrical heating in 3 nos hot air ovens for sand	15	17,70,000	31,43,000	8,61,000	kWh	E
44	Replace conventional tube lights to CFL lamps(122 nos) in offices	3	20,000	65,000	18,000	kWh	E
45	Install LEDs in place of indicating lamps	3	2,000	2,600	700	kWh	E
46	Replace 250W HPSV lamps with poly Lux tube lights in Frame and 1109 shops	3	12,000	33,000	9,000	kWh	E
47	Install electronic ballasts (50 Nos)	3	7,500	11,000	3,000	kWh	E
48	Install time switches for O/H lights in M/c shop	3	6,000	1,80,000	49,400	kWh	E
49	Install 60 Nos translucent roof sheets to harness day light	15	90,000	1,28,000	35,000		

## Form - 3

## Executive Summary of appraised Energy Conservation potential as identified in energy auditor report

C. No.	Area of improvement and modification	Investment Lakh Rs.	First year energy <sup>1</sup> savings					First year cost reduction <sup>2</sup> , Lakh Rs.					Life cycle years <sup>3</sup>
			oil	gas	coal	electricity	other	oil	gas	coal	electricity	other	
1.	Better house keeping measures	0	110 kL			11.65 Lakh kWh		13.2			49.90		3 years
2.	Installation of improved process monitoring and control instrumentation, or software	0	150 kL					18.0					2 years
3.	Measures in the area of lighting	0.475				0.801 Lakh kWh					2.916		3 years
4.	Sizing, changing and controlling electric motors including variable speed drives	8.29	9 kL			7.664 Lakh kWh		1.08			28.0		5 years
5.	Retrofitting, modification or sizing of fans, blowers, pumps, including duct systems	1.75				0.63 Lakh kWh					2.3		7 years
6.	Performance improvement of compressors and compressed air distribution system	45.0				19.04 Lakh kWh					69.5		7 years

<sup>1</sup> Use commercial units of litre, kg, tons, normal cubic meter, kWh or MWh and indicate the unit. Indicate the anticipated potential in energy savings.

<sup>2</sup> Anticipated cost savings in the first year based on anticipated fuel savings.

<sup>3</sup> Estimate the predicted life of the measure, meaning the number of years the level of first year energy savings or even larger amounts will materialise.

7.	Improved insulation against heat or cold losses	7.7	423 kL			1.2 Lakh kWh		54.4			4.48		3 years
8.	Recovery of waste heat for process heat or power generation	4.0	147 kL					17.6					2 years
9.	Loss reduction in transformers and power distribution within firm	20.0				0.73 Lakh kWh					2.66		10 years
10.	Fuel switching measures from fossil to fossil or fossil to renewable energy	0											
11.	Improvement of prime mover performance such as gas, steam, water, turbines or internal combustion engines	0											
12.	Improvement of steam boilers and reduction of losses in steam distribution lines	0											
13.	Modernization measures with benefits of energy consumption reduction	354.1	144 kL			29.256 Lakh kWh		25.9			106.78		10 years
14.	Modify process to improve energy efficiency	12.85	264 kL			10.19 Lakh kWh		31.7			37.2		5 years
15.	Switch over from electrical to fossil fuel or to renewable energy for cost saving	17.7				8.61 Lakh kWh					31.43		7 years

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