

Explanation for suggested Form 1

Need for Separate Form1 as per Industry Segment (such as Power, Cement, Fertilizer Etc)

- Explanation:- The information gathered will be used for comparing energy consumption performance of various industries in their respective segments. There is vast difference in Energy consumption patterns of various industry segments **and also there is variation within same industry segment as per the process and technology used.** For example a Power generation company's energy consumption per unit product will be different than that of a Cement Company and also Energy Consumption of Coal based Power Generation Company will be different than that of a Gas based or Wind Turbine Energy Generation Company. Hence a need for different forms as per industry segment and as per type of process used.

Form 1 point (4) of (A) Gross Plant Heat rate (As per Performance Test)

- Explanation:- Power Generation Companies carry out performance testing of their process and equipment on regular basis to assess their capability and deviations from design. This type of tests throw light upon actual energy consumption patterns of various process components such as Steam Boilers, turbines, regenerative feed heaters etc. This type of testing gives information about the best a plant can achieve and scope for improvement.

Form 1 point (5) of (A) Gross Plant Heat rate (On fuel consumption basis)

(As per Fuel Flow meters installed at Process Input)

- Explanation:- Fuel consumption at plant process input is continuously measured with the help of fuel flow meters. For example coal flow meters installed at Raw Coal Bunkers and oil flow meters at firing elevation. This heat rate figure give actual direct energy consumed by plant (including energy consumed during normal running and start up/ shut downs) per unit of energy generated.

Form 1 point (6) of (A) Gross Plant Heat rate (On fuel consumption basis)

(As per actual fuel consumption including losses in fuel handling)

- Explanation:- This Heat rate figure includes losses in fuel handling in addition to fuel consumption as per flow meters. Energy sent out of Generating Station or Energy billed by company may be considering for calculating this figure, as this figure is intended to reflect overall effectiveness of company.

Form - 1
Format for Information regarding Total Energy Consumption and Energy Consumption
per Unit of Production for
Power Generation Companies

Name of the company : XYZ GENERATION COMPANY LTD

Full Address : WFV Super Thermal Power Station, XYZ
Generation Company Ltd, Chandrapur,
Maharashtra. PIN-442404

Contact Person : Ex. Vice President
Email address : ankur_joshi@rediffmail.com
Telephone/ Fax numbers : 91 7172 220284
Plant Address : WFV Super Thermal Power Station.
XYZ Generation Company Ltd, Chandrapur,
Maharashtra. PIN-442404.

Type of process & technology used : Coal fired steam turbine based thermal power
generation

Primary Fuel : Coal (Bituminous Coal)
Other Fuels used : Light Diesel Oil, Heavy Furnace Oil

A. Power Generation for year

FY 2004-05

1. Annual Gross Generation **10610000000** kWh
2. Own Consumption (Auxiliary Consumption) 795750000 kWh
3. Net Generation (1)-(2) 9814250000 kWh
4. Gross Plant Heat rate (As per Performance Test) 2355 kcal/kWh

Standard used for Performance Testing As recommended by OEM

5. Gross Plant Heat rate (On Fuel Consumption Basis) 2413 kcal/kWh
(As per Fuel Flow meters installed at Process Input)
6. Gross Plant Heat rate (On Fuel Consumption Basis) 2514 kcal/kWh
(As per actual fuel consumption including losses in fuel handling)
(Consider Net Generation for calculating this Heat Rate)

B. Fuel Consumption for year**FY 2004-05**

(1) Oil (Used as Secondary Fuel) (Please see Note(1))	
(i) Heavy Furnace oil	
Annual consumption	4397 kilo liters
Gross calorific value	10000 kCal/KL
(ii) Low Sulphur Heavy Stock (LSHS)	
Annual consumption	_____ kilo liters
Gross calorific value	_____ kCal/KL
(iii) Light Diesel Oil (LDO)	
Annual consumption	5160 kilo liters
Gross calorific value	12000 kCal/KL
(iv) High Speed Diesel (HSD)	
Annual consumption	_____ kilo liters
Gross calorific value	_____ kCal/KL
(2) Gas (Not used)	
(i) Compressed Natural Gas (CNG)	
Gross calorific value	_____ kCal/NM ³
Annual consumption	_____ NM ³
Annual costs	_____ Rs. Lakhs
(ii) Liquefied Petroleum Gases (LPG)	
Gross calorific value	_____ kCal/kg
Annual consumption	_____ Tonnes
Annual costs	_____ Rs. Lakhs
(iii) Piped Natural Gas (PNG)	
Gross calorific value	_____ kCal/NM ³
Annual consumption	_____ NM ³
Annual costs	_____ Rs. Lakhs
(3) Biomass (Not used)	
Average moisture content, as fired	_____ %
Average Gross calorific value, as fired	_____ kCal/kg
Annual consumption	_____ MT
Annual biomass costs	_____ Rs. Lakhs
(4) Coal (Used as Primary Fuel)	
Gross calorific value	3500 kCal/kg
Annual consumption (as per flow meters)	7315448 Tonnes
Annual consumption (as actual including losses)	7620258 Tonnes

Note(1): Oil consumption can also be categorized as per flow meters and as actual including losses in handling. Since oil is used as secondary fuel (for startups and load stabilization) and is negligible as compared to primary fuel, its consumption is to be given as per actual including losses.

(End of Form 1)

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

Name of the company : XYZ GENERATION COMPANY LTD

Full Address : WFV Super Thermal Power Station,
 XYZ Generation Company Ltd, Chandrapur,
 Maharashtra. PIN-442404

Contact Person : Ex. Vice President

Email address : ankur_joshi@rediffmail.com

Telephone/ Fax numbers : (07172) 220284 Fax: 220284

Plant Address : WFV Super Thermal Power Station.
 XYZ Generation Company Ltd, Chandrapur,
 Maharashtra. PIN-442404.

A. Power and Fuel Consumption 2004/2005

1. Electricity

(a) Purchased **NIL**

Contract demand _____ kW

Connected load _____ kW

Annual consumption _____ kWh

Total cost _____ Rs. Lakhs

(b) Own Generation

(i) Through diesel generator **see Note (1)**

Annual generation NIL kWh

Annual diesel consumption Negligible kilo liters

Total fuel costs Negligible

(ii) Through steam turbine/generator **10610,000,000 kWh**

Annual generation **Coal, Heavy Furnace Oil & Light**

Fuel used¹

Diesel Oil

(iii) Through Gas Turbine NIL

Annual generation

2. Coal quality (Gross calorific value) 3500 kCal/kg

Annual consumption **7620258 Tonnes**

Total coal costs **80013 Rs. Lakhs**

3. Oil

(i) Furnace oil

¹ 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.

	Annual consumption	4397 kilo liters
	Annual costs	220 Rs. Lakhs
(ii)	Low Sulphur Heavy Stock (LSHS)	
	Annual consumption	Nil Tonnes
	Annual costs	Nil Rs. Lakhs ⁷
(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	5160 kilo liters
	Annual costs	516 Rs. Lakhs
5.	Gas	
(i)	Compressed Natural Gas (CNG)	Not Used
	Gross calorific value	_____ kCal/NM ³
	Annual consumption	_____ NM ³
	Annual costs	_____ Rs. Lakhs
(ii)	Liquefied Petroleum Gases (LPG)	Not Used
	Gross calorific value	_____ kCal/kg
	Annual consumption	_____ Tonnes
	Annual costs	_____ Rs. Lakhs
(iii)	Piped Natural Gas (PNG)	Not Used
	Gross calorific value	_____ kCal/NM ³
	Annual consumption	_____ NM ³
	Annual costs	_____ Rs. Lakhs
6.	Biomass	Not Used
	Average moisture content, as fired	_____ %
	Average Gross calorific value, as fired	_____ kCal/kg
	Annual consumption	_____ MT
	Annual biomass costs	_____ Rs. Lakhs

B. Product mix specifications²

Product name 1: Electricity **10610,000,000 kWh**

Note (1): Diesel is used as Emergency Fuel for Diesel Generation Sets during Grid Failure. Normally its consumption is very negligible, as it runs for very short duration and it is generally not accounted.

² 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 ¹	Investment (Rupees)	Verified savings ² (Rupees)	Verified energy savings	Units ³	Fuel ⁴
1	Modification of Flue Gas Ducts for reducing flue gas velocity, to avoid wear out of ducts due to flue gas erosion. (Saving on Draft power of Induced Draft Fans) (This measure is other than those suggested by Energy Auditors)	5	690 Lakhs	89.12 Lakhs (\$)	73,65,000	kWh	E
2	Improvement in lighting system by reducing voltage levels and by proper loading of lighting transformers	3	NIL	2.5 Lakhs (*)	1,25,000	kWh	E
3	Retrofitting / Modifications of pumps, blowers and fans, attending duct leakages etc.	5	95 Lakhs	100 Lakhs(*)	50,00,000	kWh	E
4	Performance improvements in compressed air system	6	Nil	30 Lakhs (*)	15,00,000	kWh	E
5	Use of LDO instead of HFO as emergency support fuel thereby saving loss due to keeping FO system charged. (Loss on account of steam required to keep HFO hot and to reduce its viscosity required for maintaining circulation) (This measure is other than those suggested by Energy Auditors)	10	Nil0	244.40 Lakhs (#)	77760 X 10 ⁶	Kcal	C+O

(\$) The savings are calculated assuming cost per unit as Rs 1.21 as per books.

(*) The savings are calculated assuming cost per unit as Rs 2.00 as suggested by Energy Auditors.

(#) The savings are calculated by considering an average Auxiliary PRDS steam consumption for HFO heating, which is avoided due to use of LDO.

¹ Use "C" number of form 3 as reference

² First year

³ Use conventional energy, volume or mass units with proper prefix k = 10³, M = 10⁶, G = 10⁹

⁴ 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.

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 ¹ savings					First year cost reduction ² , Lakh Rs.					Life cycle years ³	
			oil	gas	Coal (kcal)	Electricity (kWh)	other	oil	gas	coal	electricity	other		
1.	Better house keeping measures (Better maintenance practices)	NIL												
2.	Installation of improved process monitoring and control instrumentation, or software													
3.	Measures in the area of lighting	NIL				155000					3.1			Lifelong
4.	Sizing, changing and controlling electric motors including variable speed drives	151.92				3096000					61.92			Long Term (5 to 10 years)
5.	Retrofitting, modification or sizing of fans, blowers, pumps, including duct systems	66.9				5409000 0					270.45			Long Term (5 to 10 years)
6.	Performance improvement of compressors and compressed air distribution system	NIL									62.4			Short term (1 to 5 years)
7.	Improved insulation against heat or cold losses													
8.	Recovery of waste heat for process heat or power generation													

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

² Anticipated cost savings in the first year based on anticipated fuel savings.

³ 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.

9.	Loss reduction in transformers and power distribution within firm	Included in 3 above											
10.	Fuel switching measures from fossil to fossil or fossil to renewable energy												
11.	Improvement of prime mover performance such as gas, steam, water, turbines or internal combustion engines												
12.	Improvement of steam boilers and reduction of losses in steam distribution lines	10			128000 00					288			Lifelong
13.	Modernization measures with benefits of energy consumption reduction												

Name of the company : XYZ Generation Company Ltd.

Full Address :

Contact Person :

Email address :

Telephone/ Fax numbers :

Plant Address :