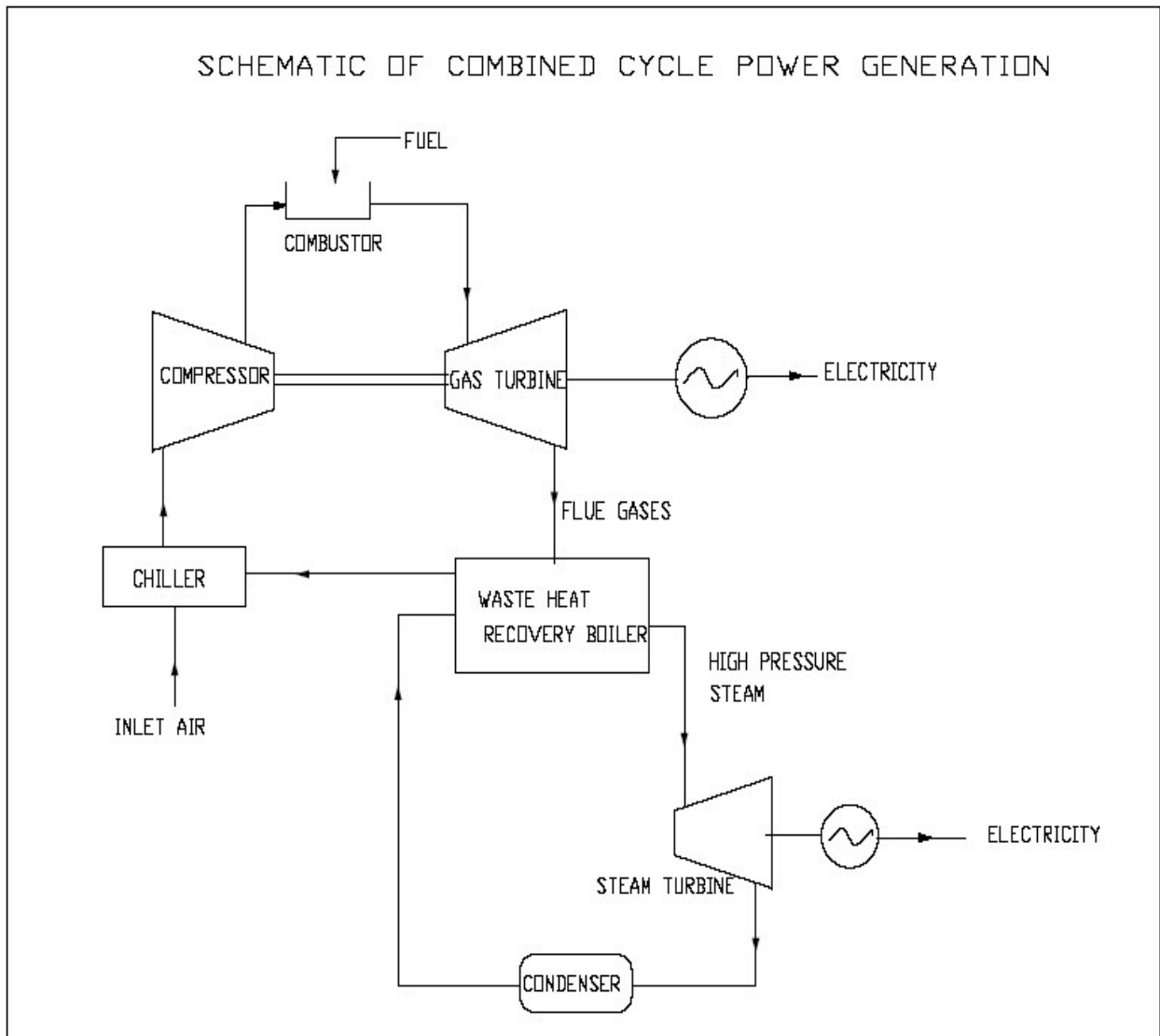


Gas Turbine Based Cogeneration

In a Combined Cycle Cogeneration, natural gas turbine coupled with an electrical generator, which produces electricity and the exhaust heat from the gas turbine is directed to a waste heat recovery boiler ("WHRB"). The steam from the WHRB is directed to a steam turbine generator where the steam can be used for power generation. By capturing the waste heat of the gas turbine in a Combined Cycle Power Plant, and putting it to work, the overall thermal efficiency of the plant is increased.



GAS TURBINE SPECIFICATIONS

- 1) Type of Gas Turbine : **EKOL UGT 2500**
- 2) Electrical output : **2760 kW**
- 3) Gas consumption at 100% of output : 1005 m³/hr
- 4) Efficiency : 28.6 %

ECONOMIC ANALYSIS

Gas Turbine based Combine Cycle Cogeneration			
Sr.No.	Description	Value	Unit
1	Electrical Output (At 10 Deg C)	2760	kW
2	Efficiency	28.60%	%
3	Natural Gas Consumption	1012.11	m3/hr
4	Power Generation	2760	kW
5	Flue Gas Flow	14.70	kg/s
6	Flue Gas Temperature	440	Deg.C
7	Steam Generation using Waste Heat Recovery boiler	7.07	TPH
8	Chilling Required for Combustion Air (10 Deg C)	109.38	TR
9	Steam Required For Chilling	406.49	kg/hr
10	Actual Steam Available For Power Generation	6.66	TPH
11	Power Generation using condensing Steam Turbine	871	kW
12	Total Power Generation Using Combined cycle	3631	kW
SAVINGS			
13	Saving on account of Power Generation	1307.3	Lacs
OPERATING COSTS			
19	Natural Gas Costs	728.72	Lacs
20	Other O&M Cost	21.86	Lacs
21	Total Operating Cost	750.58	Lacs
NET SAVINGS PER ANNUM			
22	NET SAVINGS PER ANNUM	556.7	Lacs
PER UNIT COST			
23	PER UNIT COST	2.58	Rs/kWh
PAYBACK PERIOD			
14	PAYBACK PERIOD	1.54	Year
Assumptions			
1	Natural Gas Cost	9	Rs/m3
2	Enthalpy of Steam	623	kcal/kg
3	Steam Cost	759.76	Rs/ton
4	Calorific Value of Natural Gas	8200	Kcal/m3
5	Cost of Power	4.5	Rs/kw
6	Operating Hours	8000	Hours/annum
8	Interest Rate	10%	%
9	Boiler Efficiency	90%	%