

DR. REDDY'S LABORATORIES, HYDERABAD



The Situation

Design Considerations:

-Hot water required for laboratory. -Hot water temperature required @45°C. -Optimisation of hot water generation.

The Solution

Proposed System:

4 (3w+1s) 400 KW Heat pumps, which also deliver 90 TR cooling at full load.

Energy and Operating Cost Savings for Hot Water Generation
Existing Diesel Boiler versus Proposed Heat Pump

Heating Water (from 25°C to 45°C) 8,25,600 Ltr/ day
Operating days per year 350 days

Diesel Fired Boiler			Heat Pump		
NCV Diesel	10,200	Kcal/kg		Cooling	Heating
Boiler efficiency	0.9		Heat Pump Capacity	270 TR	1,200 kw
Specific Gravity of fuel	0.9	kg./liters	Operating Temperatures	12°C/7°C	45°C
Diesel consumed per day	1,999	Liters	Heating Capacity Required	1,200	kw
Diesel consumed per year	6,99,492	Liters	Total Hot Water generated per hour	51,600	ltrs
Average Diesel cost	45.11	per Liter	Operating Hours per day	24	hours
Annual Diesel cost	315.5	Lacs	Power consumption including pump	0.28	KW/KW
@ Rs 45.11 per liter					of heating
			Units consumed per day	8,064	KW
			Yearly consumption kWh	28,22,400	KWH
		(A)	Total cost @ Rs. 7.0/kWH for Heat Pump	197.60	Lacs
			From Heat Pump while generating Hot Water 180 Tons cooling will be available.		
		(B)	Cost to produce the same by existing chiller (270 TRx0.7 kW/TRx365 daysx7 Rs./kWH)	111.10	Lacs
			Net cost of Hot Water Generation		
		(C)	By Diesel Fired Boiler @ Rs. 45.11 per liter	315.50	Lacs
		(D=A-B)	by Heat Pump @ Rs. 7.0/kWH	86.44	Lacs
		(C-D)	Annual savings by generating Hot Water from Heat Pump	229.10	Lacs

Note: Heat Pump being energy saving device and waste Heat Recovery equipment under section 80-IA, Income Tax Act, 80% depreciation is allowed of written down value.

The Results

Project Summary

Project Financials

- Total Heat Pump Cost – Rs. 80.00 Lakhs
- Expected savings per annum at 100% load – Rs. 229.1 Lakhs
- Payback period – Less than 6 months

Other advantages

- Heat Pump falls under Energy Saving Devices and depreciation @ 80% can be claimed in 1st Year
- Combustion Free Eco friendly System
- Very Low Maintenance
- Heating and Cooling Simultaneous Production