

Summary of study: EHP for Dairy: Unit - 5

Industry : Dairy

Unit profile : A dairy plant located in Ludhiana (Punjab) manufacturing a wide variety of products such as pasteurized packaged milk, ghee, butter, skimmed milk powder, whole milk powder, lassi, paneer, curd, milk cake, ice-cream, etc.

Technology : Water-heat source electric heat pump (EHP)

Application : Pre-cooling of water sent to chillers and pre-heating of water supplied to diesel fired boilers

Year of investigation : 2012



Key features:

			Proposed System
EHP	Delta T of pre-heated boiler feed water output from EHP system	°C.	50–55
	Delta T of pre-cooled chilled water output from EHP system	°C.	3–4
	Hot water flow rate	m ³ /hr	1.2–1.5
	Cold water flow rate	m ³ /hr	8.8–10.0
	Heating capacity	kW	60
	Cooling capacity	kW	38
	Power consumption	kW	24.6
	COPT	-	3.98

Energy saving and CO₂ reductions:

Parameter	Unit	For single EHP
Annual operating hours	hours	8760
Electricity unit price	Rs/kWh	6.70
Diesel oil unit price	Rs/L	55.00
Annual energy reduction cost (Lakh Rs.)/reduction rate (%)		29.90/72%
Annual CO ₂ reduction (t-CO ₂)/ reduction rate (%)		142/48%

Note:

This report is an example for investigating the potential of application of Japanese low carbon technology (LCT) in Indian industries. EHP is the LCT which can generate greater benefits by the conditions for use of the outside temperature, the incoming water temperature, and the cold water temperature, etc, since the performance will increase/decrease depending on the conditions.