

Summary of study: EHP for Dairy: Unit - 3

Industry : Dairy

Unit profile : A dairy unit located in Gujarat

Technology : Electric heat pump (EHP)

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

Year of investigation : 2012



Key features:

			Proposed System
EHP	Hot water supply temperature	$^{\circ}\text{C}$	35
	Hot water return temperature	$^{\circ}\text{C}$	90
	Cold water supply temperature	$^{\circ}\text{C}$	10
	Cold water return temperature	$^{\circ}\text{C}$	7
	Hot water supply	l min^{-1}	16.3
	Cold water supply	l min^{-1}	191.6
	Heating capacity	kW	62.6
	Cooling capacity	kW	40.1
	Electricity consumption	kW	24.7
	COPt		4.15

Energy saving:

				Current system	EHP System	Reduction (reduction ratio)
Annual impacts	Electricity	Consumption	MWh	94	174	
		Crude oil base consumption	kl	26	49	
		CO ₂ emission	t-CO ₂	87	162	
		Energy cost	Rs.	6,22,278	11,55,606	
	FO	Consumption	kl	65	0	
		Crude oil base consumption	kl	66	0	
		CO ₂ emission	t-CO ₂	177	0	
		Energy cost	Rs.	25,93,728	0	
	Total	Crude oil base consumption	kl	92	49	43 (47%)
		CO ₂ emission	t-CO ₂	264	162	102 (39%)
		Energy cost	Rs.	32,16,005	11,55,606	20,60,399 (64%)

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.