

## Summary of study: EHP for Dairy: Unit - 4

**Industry** : Dairy

**Unit profile** : A dairy plant located in Ahmedabad (Gujarat) manufacturing dairy products like paneer, cheese and butter

**Technology** : CO<sub>2</sub> based water-heat source electric heat pump (EHP)

**Application** : Pre-cooling of water sent to ice bank; pre-heating of water supplied to diesel/ natural gas fired boilers



**Year of investigation** : 2011

### Key features:

			Proposed System
EHP	Hot water outlet temperature	°C.	80
	Hot water inlet temperature	°C.	30
	Cold water inlet temperature	°C.	10
	Cold water outlet temperature	°C.	7
	Hot water flow rate	m <sup>3</sup> /hr	1.0
	Cold water flow rate	m <sup>3</sup> /hr	10.8
	COP <sub>t</sub>	-	3.93

### Energy saving:

Parameter	Unit	For single EHP
Hot water outlet temperature	°C	90
Heat source		Hot water
Cold source		Ice bank
Annual energy reduction cost (Lakh Rs.)/reduction rate (%)		28/40%
Annual CO <sub>2</sub> reduction (t-CO <sub>2</sub> )/ reduction rate (%)		70.0/36%
Electricity unit price	Rs/kWh	6.10
Diesel oil unit price	Rs/L	43.00

### 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.