

## Summary of study: EHP for Dairy: Unit - 7

**Industry** : Dairy

**Unit profile** : A dairy plant located in Manesar (Haryana) manufacturing milk products such as pasteurized liquid milk, butter milk, table butter, skimmed milk powder, whole milk powder, ghee, dairy whitener, infant milk powder, masti dahi, paneer, shrikhand and sterilized flavoured milk. The products are marketed under the brand name of Amul/ Sagar / Dudhsagar in National and International markets.



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

**Application** : Pre-cooling of water sent to chilled water tank and pre-heating of water supplied to oil fired boiler

**Year of investigation** : 2014

### Key features:

			Proposed System
EHP	Hot water inlet	°C	30
	Hot water outlet	°C	90
	Hot water flow rate	m <sup>3</sup> /hr	0.83
	Cold water inlet	°C	4
	Cold water outlet	°C	0
	Cold water flow rate	m <sup>3</sup> /hr	8.1
	Heating capacity	kW	58.2
	Cooling capacity	kW	37.6
	Power consumption	kW	22.8
	COPt	-	4.2

### Energy saving and CO<sub>2</sub> reductions:

Parameter	Unit	For single EHP
Electricity unit price	Rs/kWh	7.60
Diesel unit price	Rs/lit	48.00
FO unit price	Rs/lit	40.00
Annual energy cost reduction (Lakh Rs)/reduction rate (%)		1,332,549 / 66%
Annual CO <sub>2</sub> reduction (t-CO <sub>2</sub> )/ reduction rate (%)		163.1 / 36%

### 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.