

“Cold Storage Facility with Exergy Optimised Heat Based Refrigeration”

PREAMBLE:

The project entitled “Cold Storage Facility For Post-Harvest Preservation of Fruits & Vegetables Using Solar & Biomethane Heat Based Refrigeration” financially supported by Rajiv Gandhi Science and Technology Commission (RGSTC), Govt. of Maharashtra to elevate technology development is successfully implemented by Professor (Dr) S.S. Bhagwat, (Institute of Chemical Technology (ICT), Matunga, Mumbai 400019) at Gokul Dairy, Kolhapur. A heat based refrigeration technology is developed at Gokul Dairy, Kolhapur for Milk Chilling process which conserves energy and is cost effective. The heat based technology for refrigeration is named as 'Gokul-ICT Technology' which is a combination of Vapour Absorption and Vapour Compression Refrigeration system.

OBJECTIVES OF THE PROJECT:

- To set up an industrial scale demo unit for milk chilling using vapour absorption refrigeration technology by employing green energy source.
- To enhance the heat based refrigeration technology at essential agro based industrial area in Maharashtra.

“GOKUL-ICT TECHNOLOGY”: EXERGETIC EFFICIENT REFRIGERATION PROCESS

- The heat based technology for refrigeration is named as 'Gokul-ICT Technology' which is a combination of Vapour Absorption and Vapour Compression Refrigeration system.
- The combination has been optimised by the use of Exergy Engineering technique such that an optimum use of both technologies results in maximum benefits.
- This technology reduces electrical energy consumption by using heat energy source.
- The heat can be obtained by solar collector or by agro waste through a boiler generating steam or by direct combustion of agro waste.
- This Gokul-ICT Technology is already successfully implemented at one of the milk chilling centre of Gokul Dairy, Kolhapur, where approx. 2 lakh liter of milk is being chilled everyday.

- The operating experience of this unit at Gokul Dairy, Kolhapur is available as expertise for implementation.

SCOPE OF TECHNOLOGY

- Capital investment for 100 TR load of refrigeration will be approx. Rs. 100 lakhs.
- The total payback period for this technology can be approx. 2 years.
- This technology can be used in food industry, pharmaceutical and can be used for storage of fruits and vegetables, dairy products, medicines, etc.

MAJOR EQUIPMENT REQUIRED FOR PLANT SETUP AND PRODUCTION:

- Vapour Absorption Refrigeration Unit
- Vapour Compression Refrigeration Unit
- Cooling Tower
- Heat Source : Biomethane / Solar collector unit
- Heat Exchanger



Vapour Absorption Refrigeration unit at Gokul Dairy, Kolhapur