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## **INCREASING ENERGY AND ECONOMIC EFFICIENCY AND DECREASING ENVIRONMENTAL IMPACTS IN AN ICE CREAM COMPANY**

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### **Abstract**

There are industrial processes where cold and heat are used. In such a process, a heat pump integrated into a refrigeration system lead to energy savings. This paper analyzes two-stage compression refrigeration combined with a compression heat pump. A case study is made based on a proposed mathematical model and on the measurements performed in an ice cream company. Three operation regimes are simulated for different hot water temperatures obtained from the heat pump. The energetic efficiency, economic efficiency and environmental impact of the system are then analyzed and the results are an increase in energy and economic efficiency and a reduction of the environmental impact while also reducing the hot water temperature.

*Key words:* energy-economic efficiency, environmental impact, heat pump, refrigeration

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