

# Business building environmental energy storage refrigeration

Does a food retail trade building need a heat recovery system?

Accordingly, this component of energy consumption in food retail trade buildings has a great potential for improvement, even when coupled with the HVAC system to take advantage of the heat recovery from the condensation phase in the refrigeration cycle.

Is space heating and cooling a viable energy storage solution?

Space heating and cooling account for up to 40% of the energy used in commercial buildings.<sup>1</sup> Aligning this energy consumption with renewable energy generation through practical and viable energy storage solutions will be critical to achieving 100% clean energy by 2050.

What is commercial refrigeration?

Commercial refrigeration, i.e., food retail refrigeration, consists of equipment to both store and display frozen or chilled goods for commercial sale. In detail, equipment used in these stores may be grouped into mechanical refrigeration machines, display refrigerators, storage refrigerators, and processing refrigerators (ASHRAE, 2018).

How can a refrigeration system save energy?

According to the results, the highest potential of energy saving is achieved by using a system with both heat recovery and floating condensation and evaporation that consist of allowing the condensation and evaporation temperatures of a refrigeration circuit to fluctuate freely.

Can a refrigeration-integrated heating and cooling system reduce energy consumption?

The authors suggested that the adoption of a refrigeration-integrated heating and cooling system with thermal storage can lead to a decrease in annual GHG emissions and energy consumption by 13% and 18%, respectively, compared to a conventional heat recovery plus gas boiler solution.

How to reduce energy consumption in food retail trade buildings?

Energy recovery is a very useful strategy to decrease the total energy consumption in complex food retail trade buildings. However, when designing air-conditioning systems, considering passive and active strategies that allow for the reduction of the zone energy demand and consumption is also important.



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