

Can ice storage systems be optimized for seasonal energy storage?

While the optimization of the design and operation of energy systems with seasonal thermal energy storage has been the focus of several recent research efforts, there is a clear gap in the literature on the optimization of systems employing ice storage systems, particularly for seasonal energy storage purposes.

What is ice storage?

The expression "ice storage" commonly defines thermal storage employing the enthalpy difference of water during its phase change from liquid to solid. The high latent heat of fusion of water results in a higher energy density for this type of storage compared to water-based sensible storage, leading to smaller volumes.

What energy systems do ice rinks use?

Ice rink operation is mainly focused on the following energy systems: refrigeration, heating, dehumidification, lighting and ventilation. The refrigeration system is the largest energy consumer in ice rinks (40 to 65%) and therefore represents the most significant potential for savings.

Why is ice storage important?

Since the melting temperature of water is 0 °C, ice storage systems are used as a heat source during the heating season, to provide free cooling during summer. Ice storages are normally employed for demand peak shaving rather than seasonal load shifting, and are therefore limited in size with a clear operation objective.

Is energy usage a major expenditure in ice hockey?

Energy usage is a major expenditure. Sustainable energy systems in an ice rink present an opportunity for a significantly more cost-competitive ice rental rate, making ice hockey more affordable. This chapter provides a general overview about the

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This study deals with mathematical modeling and energy analysis of an ice rink cooling system with an underground thermal energy storage tank. The cooling system consists of an ice rink, chiller unit, and spherical thermal energy ...

The energy efficiency of ice hockey arenas is a central concern for the administrations, as these buildings are well known to consume a large amount of energy. Since they are composite, ...

According to the International Ice Hockey Federation (IIHF)'s new Guide to Sustainable Ice Arenas, improving the energy efficiency of an ice arena is one of the most important ways to make the facility more sustainable. The ...

One solution to planet overheating may come from a fairly obvious source: ice.. Israel-based Nostromo has developed an IceBrick energy storage system that its experts said ...

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