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Title: High-efficiency photovoltaic energy storage cabinet for oil refineries

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Can a TRNSYS solar heating system be used in a refinery?

Using TRNSYS software, the proposed Parabolic Trough Collector (PTC)-based solar heating system paired with the boiler is modelled. Sensible thermal energy storage (TES) system is integrated into the refinery's process heating to handle the intermittent nature of solar energy.

Can solar hybrid system generate steam in oil refinery?

Conclusion The present study investigates the feasibility of solar hybrid system to generate steam in the oil refinery to maintain the temperature of heavy crude oil products before despatching from storage tanks. Due to the intermittent behaviour of solar energy, the solar hybrid system is integrated with a sensible heat storage tank.

What is the exergy efficiency of a refinery?

Most of the steam is to be used for the atmospheric distillation process, which is one of the most energy-intensive processes of a refinery. Furthermore, the exergy balance is shown in Fig. 12 c, which attests to an exergy efficiency of the plant of 55.5%. The energy efficiency determined from the energy balance is 82.4%.

Can solar energy systems decarbonize oil refineries?

Other studies in the literature considered coupling solar energy systems to oil refineries to decarbonize their operation. The applicability and feasibility of introducing a concentrated solar power (CSP) system to reduce partial reliance on process heaters of a crude oil refinery was studied by Danish et al. .

Sensible thermal energy storage (TES) system is integrated into the refinery's process heating to handle the intermittent nature of solar energy.

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