

# **Low-pressure solar-powered containerized oil refineries**





## Overview

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Can solar energy drive crude oil refineries?

Employing solar energy to drive crude oil refineries is one of the investigated pathways for using renewable energy sources to support lowering the carbon emissions and environmental impact of operating the processing of fossil-based fuels.

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.

How efficient is solar energy in crude oil heating?

The thermodynamic analyses described earlier is utilized to assess the system performance. The energy and exergy efficiencies of the system are found to be 60.94% and 19.34%, respectively. Furthermore, for a 10% solar share in crude oil heating, 11,950 tons of CO<sub>2</sub> emission are avoided per year.

Can solar-assisted petrochemical refineries greenize oil refineries?

This paper proposes a solar-assisted method for a petrochemical refinery, considering hydrogen production deployed in Yanbu, Saudi Arabia, as a case study to greenize oil refineries.



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Sep 25, 2025 · Concentrated Solar Thermal offers a pathway to decarbonising oil refining by replacing fossil-fuelled steam with solar-powered alternatives.

### [Powering an oil refinery with solar energy](#)

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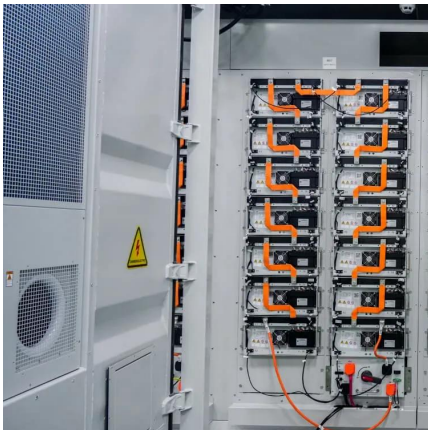


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## Analysis and assessment of using an integrated solar energy ...

Aug 1, 2019 · In large crude oil refineries, keeping emission levels low and minimizing energy losses can primarily be controlled by performing thermo-economic and environmental ...

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May 13, 2024 · The solar heating system for crude oil utilizes traditional oil heaters for preheating, coupled with renewable solar energy, to implement a low-carbon heating method.



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