

# Three-phase protocol for solar-powered containers used in oil refineries





## Overview

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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.

Can solar energy be used in oil refineries?

Hydrogen is a significant raw material in petrochemical hydrogenation process (e.g., hydrocracking, hydrotreating), whereas steam has multiple uses within a refinery. Other studies on solar-thermal-assisted refineries are summarized here as follows. In Absi Halabi et al. , the application of solar energy in the oil industry is reviewed.

Can a solar heliostat field support a crude oil refinery decarbonization?

A hybrid energy system is proposed and analyzed thermodynamically with a solar heliostat field, tower, and receiver integrated to support the decarbonization of a crude oil refinery for the city of Yanbu, Saudi Arabia, as a case study. The solar plant was optimized, and the contour plot for the heliostat field is simulated.

Can solar catalytic chemical looping Biomass Refinery produce high purity hydrogen?

A techno-economic analysis of solar catalytic chemical looping biomass refinery for sustainable production of high purity hydrogen. Energy Convers. Manage. 243, 114341 (2021) Mohammed, S.A.; Al-Azawiey, S.S.; Ali, A.H.: Treatment of organic compounds resulting from oil refineries under solar light and reuse it for industrial purpose.



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Solar oil refinery: Solar-driven hybrid chemical cracking of ...

Jan 15, 2024 · This includes the framework and outline of the solar reactive utilization, model and construction of the solar-driven hybrid chemical cracking oil system, cyclic voltammetry ...

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TECHNICAL AND ECONOMIC ANALYSIS OF ...

Sep 14, 2025 · The present work studies the viability of retrofitting concentrated solar collector (CSC) represented by parabolic trough collector (PTC) through the crude oil distillation ...

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Solar Thermal Technologies for Process Heat Applications in Oil ...

This chapter deals with the implementation of solar heat for various processes in the oil and gas industries. In addition, the selection of appropriate solar thermal technologies to meet the ...

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(PDF) Solar-assisted hybrid oil heating system ...

Jul 16, 2023 · The purpose of this study is to investigate the potential use of solar energy within an oil refinery to reduce its fossil fuel consumption and ...

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(PDF) Solar-assisted hybrid oil heating system for heavy ...

Jul 16, 2023 · The purpose of this study is to investigate the potential use of solar energy within an oil refinery to reduce its fossil fuel consumption and greenhouse gas emissions. A validated ...

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(PDF) A comprehensive thermodynamic ...

Feb 1, 2022 · In this work, we present an integrated energy system for solar enhanced oil recovery (SEOR) process accompanied with electricity ...

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Solar-assisted hybrid oil heating system for heavy refinery ...

Sep 1, 2023 · The purpose of this study is to investigate the potential use of solar energy within an oil refinery to reduce its fossil fuel consumption and greenhouse gas emissions. A validated ...

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

This study aims to investigate a novel thermal design for an industrial heating process, study an integrated system of different components into overall plant, and incorporate solar energy in ...

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Solar-assisted hybrid oil heating system for heavy refinery ...

Oct 24, 2025 · A validated ASPEN HYSYS model was used to investigate the products produced from heavy crude oil in the refinery. Using TRNSYS software, the proposed Parabolic Trough ...

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(PDF) A comprehensive thermodynamic analysis of an integrated solar



Feb 1, 2022 · In this work, we present an integrated energy system for solar enhanced oil recovery (SEOR) process accompanied with electricity generation, fresh water and elemental ...

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Published at Energy Conversion and management

Jan 30, 2024 · Abstract: Built on the Solar Reactive Utilization framework, this study presents an innovative concept called the Solar Oil Refinery, applying solar energy in the energy ...

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Analysis of a Solar-Assisted Crude Oil Refinery System

Jun 6, 2024 · With the growing urge to decarbonize the energy sector, actions toward reducing emissions of the oil and gas sector can contribute to bringing large cuts to carbon emissions. ...

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