IEA SHC Solar Award 2024
Five Projects Shortlisted

Five projects shortlisted for the International Energy Agency Solar Heating Programme (IEA SHC) 2024 SHC SOLAR AWARD. The winner will be announced at the award ceremony on August 29th during the ISES and IEA SHC co-organized conference, EuroSun 2024, in Limassol, Cyprus.

The 14th IEA SHC Solar Award recognizes projects that reduce **costs and emissions by incorporating solar thermal technologies in an industrial process.** Eighteen projects were nominated, and five were shortlisted after careful evaluation by an international team of judges. The recipient of the 2024 Solar Award will be one of our five finalist projects from France, Kenya, Spain, Uganda, and the United States.

LACTOSOL – VERDUN, FRANCE

LACTOSOL demonstrates an industrial process that competitively reduces gas consumption using solar heat technology at the process level.

LACTOSOL uses solar heat to convert liquid whey, a by-product of cheesemaking, into whey powder for the food industry. A gas boiler powered the drying tower used to dry the liquid whey, so it turned to solar when the company Lactalis Ingredients wanted to meet its carbon footprint reduction commitment. Newheat took this opportunity to design, build, and finance the solar thermal plant using an onsite proprietary hot water loop. The results show that the solar thermal plant generates about 8,500 MWh, reducing the site's gas consumption by 6% (11% for the drying tower and 30% for preheating needs) and CO_2 emissions by 2,000 tons per year.

LACTOSOL is France's largest solar thermal plant and the second largest in Europe, serving an industrial site. The process level integration of this project is a unique showcase of the potential to decarbonize heat in industrial processes competitively and effectively. The project was developed under the "Heat as a Service Scheme," with Newheat as a majority shareholder and EPC contractor, thus taking on the technical and financial risk for the project. This model is particularly promising for developing industrial solar heat – it allows the industrial heat consumer to focus on their core business.

► **LACTOSOL plant in Verdun, France, collaborates with Newheat to manage the technical and financial aspects of the solar heat technology in its cheesemaking process.**
Project: NEWHEAT / photo credit: IMAGESinAIR Productions

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SOLCOOLDRY – MWAZARO, KENYA

SolCoolDry project demonstrates the advantages of a 100% solar-powered, off-grid food processing system for ice production and drying.

▲ **SolCoolDry facility in Kenya uses a combination of solar thermal and solar PV for food drying.**
Photo credits: Fraunhofer Institute for Solar Energy Systems ISE

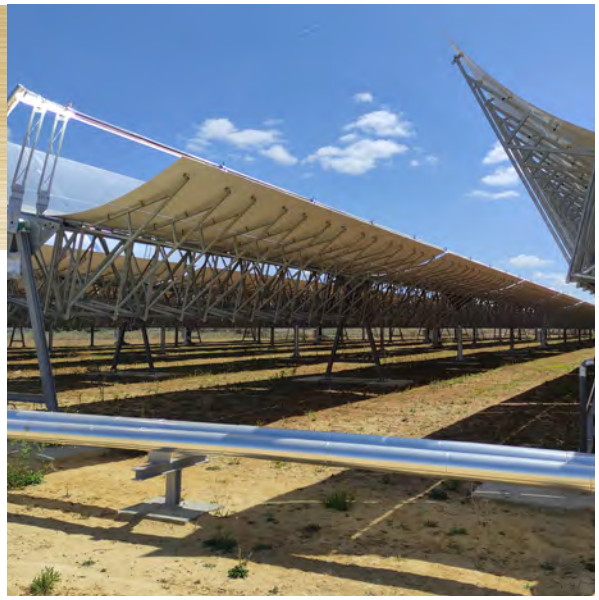
The SolCoolDry project combines the advantages of solar thermal and photovoltaics for two processes: ice production and food drying. Located in the southern coastal region of Kenya, the combination of solar applications – solar thermal and photovoltaics – means the local fishermen and other farmers have a 24-hour running solar drying system to dry produce and locally produced ice for cooling fish and other produce.

The first part of the SolCoolDry system consists of a 15-kilowatt peak rooftop photovoltaic system with three inverters and a 19.2 kilowatt-hour Lithium NMC battery storage. This powers the flake ice machine and the ice storage room. The second part of the system is two solar tunnel food dryers using heated air during the day. One of the dryers is equipped with a heat exchanger supplied with heat from a 2000-liter hot water storage tank, which is heated by 12 m^2 of flat-plate collectors during the day so that it can run for 24 hours. To make the system totally independent, a water treatment system is being built to use the groundwater on-site instead of an outside water supply.

The success of this self-sufficient, off-grid food preservation and processing system has significantly reduced post-harvest losses and caught the attention of others. The Kenyan solar enterprise WeTu at Lake Victoria is replicating this system, and there is no doubt that this is only the beginning of similar Kenyan implemented projects.

HEINEKEN SEVILLE – SEVILLE, SPAIN

The Heineken Seville brewery holds the title of largest solar thermal plant for industrial use in Europe and marks the first use of Concentrated Solar Power (CSP) technology in a factory, reducing gas consumption by 60%.



Heineken Seville combines thermodynamic principles and CSP technology into a factory setting for the first time. This pioneering technological advancement significantly enhances energy reliability and availability by doubling the production capacity of superheated water for industrial use. Plus, using water as a heat transfer fluid eliminates the need for synthetic oils that could potentially harm the environment. The 7-hectare solar field with 43,414 m^2 of mirrors and CSP (Concentrated Solar Power) solar thermal technology has an installed thermal power of 30.38 MW and thermal storage of 68 MWh. What this means for the environment is an emissions reduction of 8,924

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tons of CO_2 annually and a 60% reduction in fossil fuel consumption.

With an investment of 20.47 million euros in a public-private collaboration involving ENGIE Spain, Heineken Spain, and national, regional, and local public administrations, the project is co-financed by the European Regional Development Fund (FEDER) and managed by the Institute for Energy Diversification and Saving (IDAE). Heineken Spain and ENGIE Spain have formed an alliance through a Thermal Purchase Agreement (TPA), where Heineken pays for the energy consumed and provides the land, while ENGIE commits to supplying fully renewable energy at a predetermined price. After 20 years, the solar thermal plant will transfer ownership to Heineken.

► **Heineken Seville's Thermal Purchase Agreement with ENGIE Spain leads to the first of its kind, a factory using Concentrated Solar Power (CSP) and Europe's largest SHIP (solar heat for industrial processes) plant.**
Photo credits: AZTEQ/Solarlite - Engie

SOLAR FOOD PROCESSING – KANGULUMIRA, UGANDA

Fruit, especially pineapples, have been sundried for decades in Uganda. However, the production process was hampered by production losses of up to 40%. This project demonstrates an integrated farm2fork system solution for a self-sufficient solar pineapple drying facility.

▲ **Farming cooperative turns to solar heat to improve drying process and increase production. Strong partnerships have led to a project that goes beyond fruit drying to economic, ecological, and social benefits for surrounding communities.**
Photo credit: Russel Pictures, Uganda

This holistic agriculture approach takes pineapples from the field to a 100% solar-processed product for international markets. 100% solar with a 5-year payback is achieved by combining solar heat (covering 80% of energy needs with photovoltaic (covering the remaining 20%). What makes this project, TWIGA Sun Fruits, unique is its focus on sustainability – Economic impact: local production and shortened value chain from producers to consumers; Social impact: high-quality jobs for women in rural regions; and Ecological impact: 100% solar-powered operations.

Based on Appropriate Technology, the system is easily adaptable to different countries and agricultural products. Its innovative use of solar thermal energy for process heat distinguishes it in sub-Saharan Africa, which hosts only 0.4% of global solar thermal applications. Additionally, integrating an ERP software solution ensures complete product traceability to the agricultural producer, enhancing transparency, including farmer payments. Partnerships are central to this project, involving cooperation with smallholder farmers, the solar company All in Trade Ltd (AiT), Makerere University (MAK), the Management Center Innsbruck (MCI), and the University of Innsbruck for expertise in food processing, energy efficiency, and renewable energies.

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BALL CORPORATION
FAIRFIELD, CALIFORNIA, UNITED STATES

The Ball Corporation, one of the world's largest producers of aluminum packaging specializing in beverage cans, turns to solar heat to produce up to 8 million aluminum cans daily at its Fairfield, California plant.

Using solar thermal at its Fairfield facility demonstrates why solar is a sound financial and environmental decision. This manufacturing site requires substantial heat, around 60°C (140°F), for its operational processes and product cleaning. With sustainability as a core focus, Ball Corporation embarked on a groundbreaking initiative that culminated in a collaboration with SOLID.

In partnership with TIGI, SOLID designed and constructed a 3,956 m^2 solar heat plant boasting a thermal capacity of 2.8 MW. This project is California's largest solar thermal facility and the second largest in the United States, projected to save over 200,000 therms (5,860 MWh) of natural gas annually.

At the heart of this project is the innovative integration of a new hot water loop, significantly minimizing losses compared to conventional steam networks. Distributing hot water at 80°C through optimally sized pipes reduces distribution losses from approximately 30% in the previous steam system to about 5%. By 2025, the plan is complete decarbonization by decommissioning boilers, retiring the steam system, and installing a heat pump to complement the solar setup. The project was made possible through a Heat Purchase Agreement facilitated by SOLID America Energy Services LLC, jointly owned by TIGI Solar and SOLID Solar Energy Systems, which financed the project, secured grants, and now manages operations and maintenance.

To learn more about this year's SHC Solar Award and past awards, visit https://www.iea-shc.org/solar-award.

► **Ball Corporation's Fairfield plant uses a Heat Purchase Agreement with SOLID Solar Energy Systems and TIGI Solar to build California's largest solar thermal facility and second largest in the US. The projected savings are over 5,860 MWh of natural gas annually.** Photo credit: SOLID Solar Energy Systems