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# Solar Thermal at Boortmalt Malting Plant



**CASE STUDY**  
August 2024

*Solar thermal at the Boortmalt malting plant in Issoudun, France*

## Project Overview

Boortmalt, a global malting company and subsidiary of the agriculture and agribusiness cooperative Axereal, partnered with Kyotherm, an Energy-as-a-Service (EaaS) investment company, to commission a solar thermal plant at its Issoudun, France, malting plant in 2021. The solar thermal plant generates 8.5 GWh of renewable heat per year, supplying approximately 10% of the Issoudun plant's thermal energy demand and avoiding 2,100 metric tons of CO<sub>2</sub> emissions annually. With 3,000 m<sup>3</sup> of storage, the flat plate solar thermal system delivers hot water to preheat the air in the malthouse up to 67°C for barley drying. This solar thermal plant supplements the Issoudun malting plant's existing supply of low-carbon heat from waste-derived biomass and waste heat recovery systems, and contributes to Boortmalt's goal of reducing CO<sub>2</sub> emissions across its global operations by 50% by 2030.

***“80% of the cost per kWh of the project is linked to the investment costs, and so optimising funding was vital to its execution.”***

- Arnaud Susplugas  
CEO of Kyotherm

### LOCATION

Issoudun, France

### INDUSTRY TYPE

Food and beverage

### FACILITY TYPE

Malting plant

### TEMPERATURE

67°C

### TECHNOLOGY DEPLOYED

Solar thermal (flat plate)

### EMISSIONS IMPACT

Avoids 2,100 metric tons of CO<sub>2</sub> emissions annually

## Project Description

Kyotherm developed and financed the solar thermal plant at the Boortmalt malting plant in Issoudun based on an EaaS model and with support from ADEME, the French Environment and Energy Management Agency. In 2018, Kyotherm received a €3 million grant and €500,000 in reimbursable aid for the project from ADEME, covering approximately 60% of the total €6 million capital cost. Kyotherm provided the remaining capital investment through equity financing along with a senior loan from Crédit Coopératif. With the funding secured, Kyotherm signed a 20-year heat supply contract with Boortmalt. This financing structure enabled Boortmalt to install the solar thermal system with no capital expenditure (CapEx) and pay only for the heat delivered at a competitive fixed price over the 20-year contract term.

[www.renewablethermal.org](http://www.renewablethermal.org)

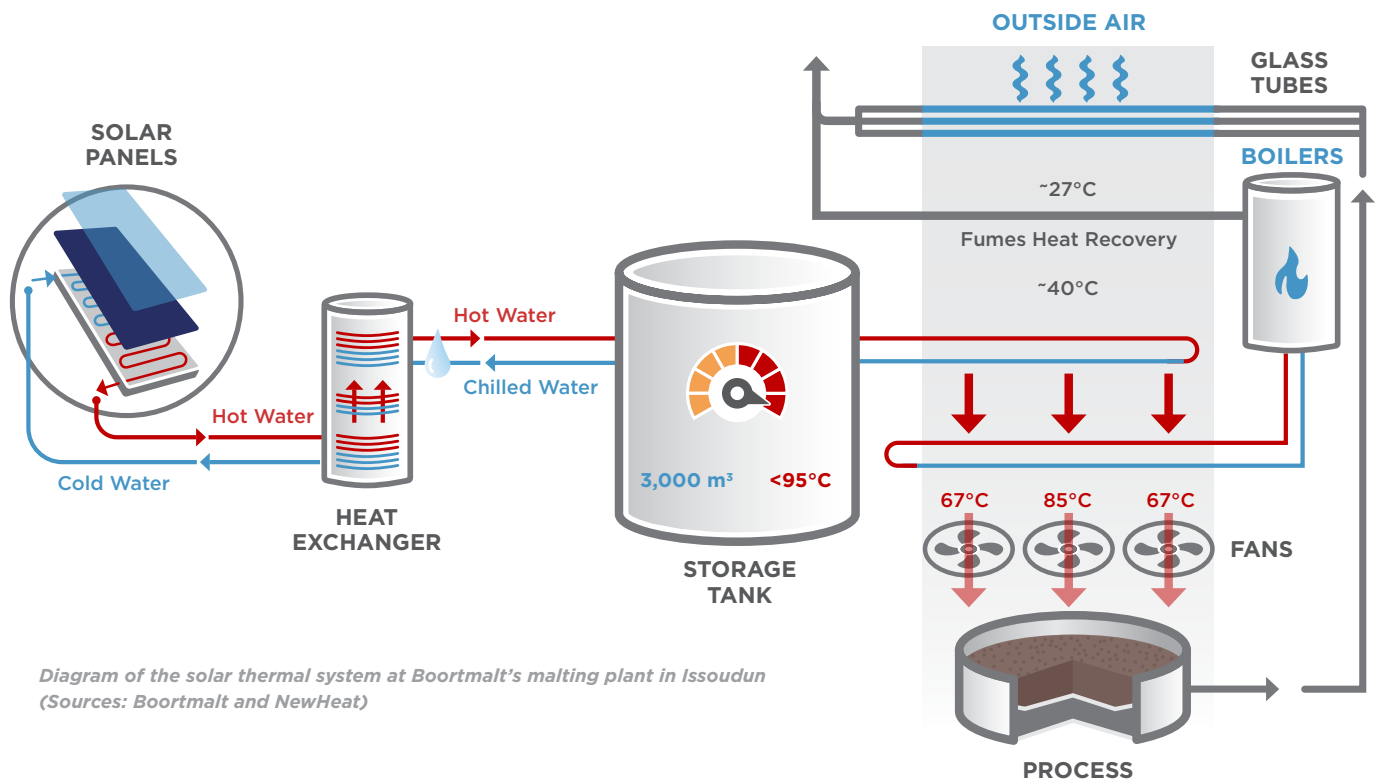


Diagram of the solar thermal system at Boortmalt's malting plant in Issoudun (Sources: Boortmalt and NewHeat)

Kyotherm implemented the project with several technical partners, including: Savosolar for solar collector manufacturing as well as plant design and construction; Sunoptimo for hydraulic equipment design and installation; Eiffage for storage tank design and construction; Dalkia for integration with the malting plant's existing infrastructure; and NewHeat for project management, operation, and maintenance. Building and installing the solar thermal plant took two years in total from 2019 to 2021. Integration with the malting plant's existing infrastructure required no operational downtime. As part of its project management contract with Kyotherm, NewHeat remotely operates the solar thermal plant and works with Dalkia and local companies for onsite maintenance to guarantee heat delivery over the 20-year term. A subsidiary of Kyotherm called Kyotherm Solar owns the solar thermal plant.

The 14,252 m<sup>2</sup> solar thermal plant has a 10 MW nameplate capacity, delivering 596 kWh/m<sup>2</sup>. The system delivers hot water to a 3,000 m<sup>3</sup> above-ground tank, storing it at temperatures up to 95°C and dispatching it when needed to preheat the air

in the malthouse. The malthouse temperature must gradually increase from 50°C to 67°C to dry barley. As the solar thermal plant supplies only 10% of the malting plant's thermal energy demand, Boortmalt uses waste-derived biomass, a gas cogeneration plant, and traditional gas boilers to supply heat for barley drying at night or during periods of low solar irradiation.

## Key Outcomes

Preheating the air used for barley drying with solar heat reduces Boortmalt's use of gas boilers, enabling the company to reduce its exposure to volatile natural gas prices and cut its emissions by 2,100 metric tons of CO<sub>2</sub> per year. The solar thermal plant meets 10% of the malting plant's thermal energy demand, with the remaining thermal load met by biomass (25%), gas cogeneration (15%), and traditional gas boilers (50%). Thanks to the EaaS model and Boortmalt's partnership with Kyotherm, Boortmalt implemented the solar thermal plant with no capital investment and now enjoys energy cost savings.

## Lessons Learned

- **Thermal storage increases solar thermal's impact.** Pairing the solar thermal plant with a 3,000 m<sup>3</sup> water storage tank enables solar heat delivery during the evening hours and periods of low solar irradiation. This decreases the system's levelized cost of heat, reduces Boortmalt's exposure to volatile fossil fuel prices, and increases emissions savings.
- **Energy-as-a-Service enables high CapEx projects.** Kyotherm's EaaS financing model enabled Boortmalt to pursue this project and make progress on its decarbonization goals with no CapEx and minimal risk. Combining public funding from ADEME and private investment from Kyotherm was also critical to the project's success.

***“This project reinforces our conviction that solar thermal has a major role to play in the decarbonisation of industrial processes. Today we want to go further. We are thus discussing with several large industrial players seeking to initiate the energy transition on their sites.”***

**- Rémi Cuer**  
Investment Director at Kyotherm

## Next Steps

Buyers interested in learning more about renewable thermal technology should:

- Watch a [video](#) about the solar thermal plant at Boortmalt's malting plant in Issoudun.
- See more information on the applications and market potential of solar thermal energy in the RTC's [Solar Thermal Action Plan](#) and [Renewable Thermal Vision Report](#).
- Read more [case studies](#) from the RTC to learn how energy users and solutions providers are deploying renewable thermal technologies.
- Find Solutions Providers through the RTC's [Partner Locator](#).
- Join the RTC to participate in working group meetings, learn from other renewable thermal buyers, and connect with solutions providers. Contact the RTC's Membership Director, Perry Hodgkins Jones ([perry@dgardiner.com](mailto:perry@dgardiner.com)) to learn more.



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The Renewable Thermal Collaborative (RTC) is the global coalition for companies, institutions, and governments committed to scaling up renewable heating and cooling at their facilities. Learn more about our work on solar thermal as well as other renewable thermal energy sources at [www.renewablethermal.org](http://www.renewablethermal.org).

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