



PRESS KIT

**Construction of the world's third largest solar thermal power plant
supplying an industrial site to produce hot water for the Issoudun
malting plant**

5 December 2018

SOLAR THERMAL POWER PLANT PROJECT

The project - winner of the RFP: "Major solar thermal installations of ADEME"¹ - is to install in 2019 a solar thermal power plant in the grounds of the Issoudun malting facility. This thermal power plant will produce the hot water (<70°C) supplying the malting facility's barley drying units.

The total surface area of the plant's solar panels will be approximately 15,000m², making it today the world's 3rd largest solar thermal power plant supplying an industrial site².

Its rated capacity will be around 12 MW and it will supply around 8.7 GWh of heat per year, or **one-tenth of the site's needs**. This heat will make it possible to reduce the natural gas consumption of the site and cut **CO₂ emissions by around 2,200 tonnes per year**. This is equivalent to removing 1,100 new vehicles from circulation.



Aerial view of the Issoudun malting plant (photo credit: Boortmalt)

THE SITE'S EXEMPLARY ENERGY DIVERSIFICATION

Boortmalt operates the Malteries Franco-Suisses (MFS) site at Issoudun. Malting is an industrial process which involves germinating grains of barley (or wheat) and then using hot air to dry them, gradually increasing the temperature from 50°C to 85°C. This stage of the process, called kilning, is particularly energy intensive.

Boortmalt has already set up an advanced heat recovery system to optimise energy consumption (by recycling the hot air used in the industrial process via glass tubes, and recovering heat from boiler flue gases).

This optimisation also involves the use of lower-carbon energy sources, with the installation of a biomass boiler (with support from the Heat Fund (Fonds Chaleur). The group now wishes to make use of solar thermal energy, a local, carbon-free energy source with predictable costs.

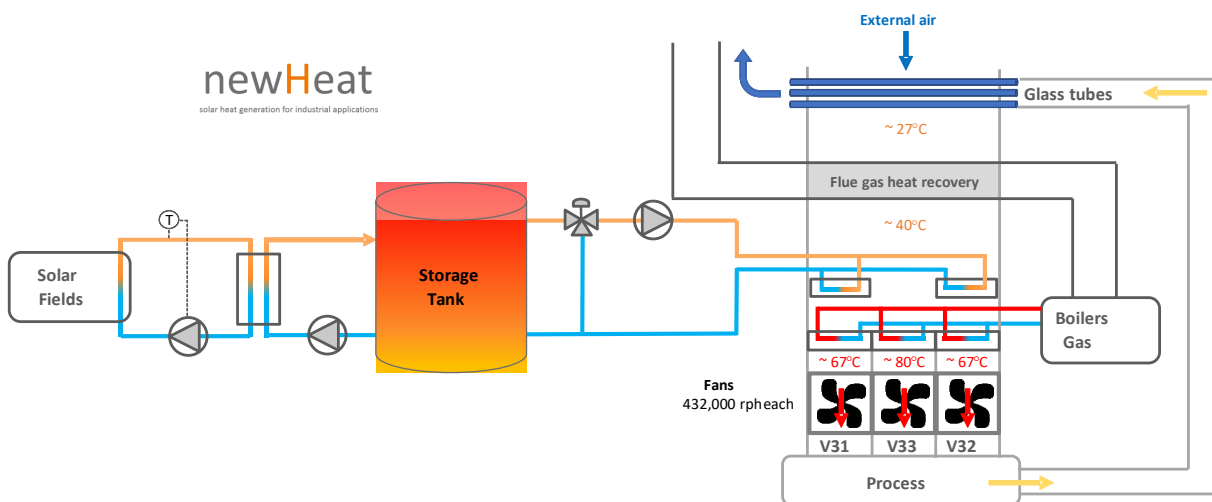
¹ <https://presse.ademe.fr/2018/05/appelaprojets-grandes-installations-solaires-thermiques-de-production-deau-chaude.html>

² Solar Heat for Industrial Processes - SHIP - IEA Task 49/IV

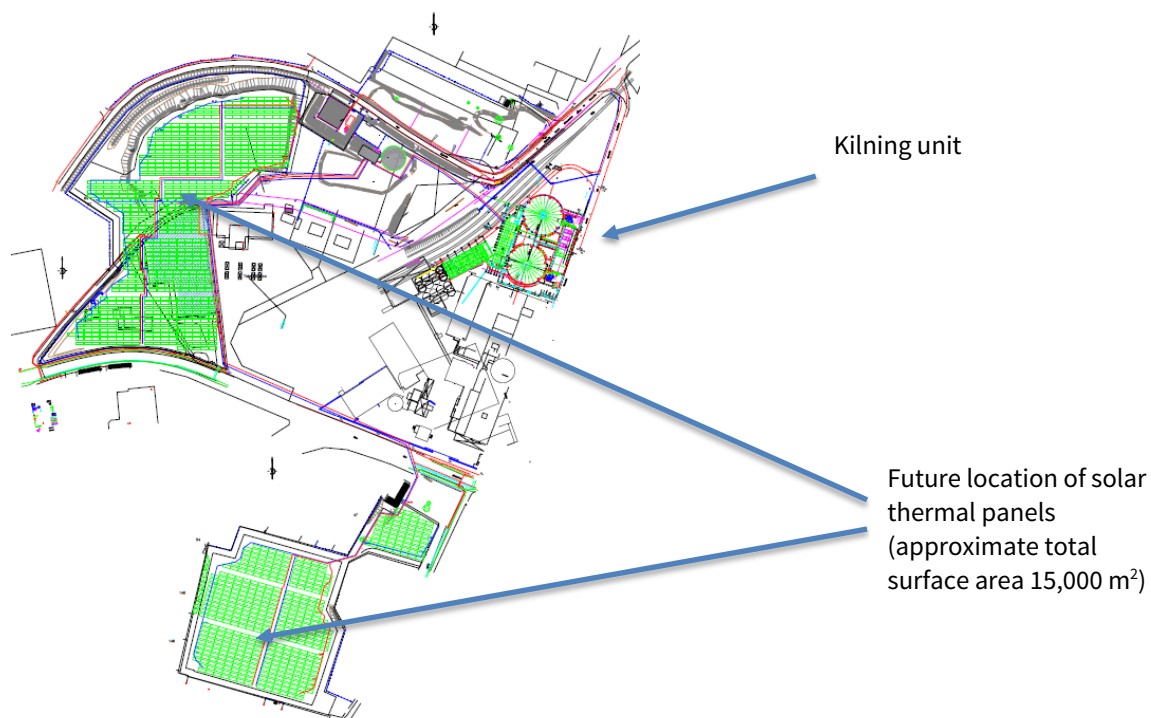
MFS selected a grouping represented by Kyotherm to work with it on this project. As a third-party finance provider, Kyotherm's role is to raise the financing, carry out the work, and then sell the heat back to MFS.

The Project:

- The solar thermal power plant will pre-heat the air supplied to the malting plant's U3 kilning unit. It will fit into the process after the energy recovery systems currently in place on the unit and before the current combustion systems.
- The plant, which will be installed on the ground, will consist of several fields of solar thermal panels, large glass surfaces set on fixed structures (the gross area of the panels will be around 15,000 m²).
- Solar energy production will cover around 10.5% of the site's annual heat requirement, entirely replacing the current natural gas combustion systems.



Integration of solar generated heat into the industrial process



ADEME AGREEMENT

Kyotherm Solar (a Kyotherm subsidiary, future power plant project owner), Malteries Franco Suisses (a Boortmalt subsidiary) and ADEME have today signed an agreement allocating the project:

- ✓ **a grant of up to €3,012,451;**
- ✓ **a loan of up to €531,609.**

Arnaud Leroy, President of ADEME, said: "Signing this agreement marks ADEME's support for this ambitious project, and more widely for the development of industrial solar thermal power in France."

Yvan Schaepman, CEO of Boortmalt, said: "This project demonstrates our ongoing commitment to securing supplies of clean energy. We had already called upon the support of ADEME to put in place a biomass boiler on the site in 2013."

Arnaud Susplugas, President of Kyotherm, said: "80% of the cost per kWh of the project is linked to the investment costs, and so optimising funding was vital to its execution."

The three partners will work together on this ambitious, innovative, benchmark project:

- ❖ **Boortmalt** (malting plant operator), an Axereal cooperative subsidiary, operates the site which has been working since 1999 to reduce its environmental footprint. More than 40% of the heat consumed by the Issoudun malting plant already comes from low-carbon sources (biomass and heat recovered from cogeneration).
- ❖ **ADEME** will contribute its technical expertise, together with financial support via the Heat Fund.
- ❖ **Kyotherm** (a third-party finance provider working on renewable heat production projects) provides equity financing with an optimised cost of capital for solar thermal projects. By their nature, solar thermal projects require high investment but have very low operational costs. The cost of capital must therefore

be optimised in order to supply carbon-free heat at a competitive price compared to fossil fuels, as will be achieved in this case.

For this project, Kyotherm will work closely with the following technical partners:

- **Sunoptimo:** a developer and designer of solar thermal solutions housed in containers. It is the company behind the project, and will be designing the hydraulic equipment.
- **NewHeat:** solar heat production specialist. It will be involved in developing and designing the solution, and project managing its installation. It will then run and maintain it for 20 years.
- **Dalkia (EDF group):** the malting plant's partner and energy operator since 1999. It will look after the integration of solar thermal energy into the current systems, in terms of both design and operations.

Insert photo of signing

THE FUTURE POTENTIAL OF SOLAR THERMAL ENERGY

Solar thermal is a **non-carbon-emitting heat production technology** with few negative externalities. Its annual incident solar energy transformation efficiency of 40 to 50% places it among the leading renewable energy sources. In France, panel productivity is around 500kWh per m², making systems cost-effective as long as costs are controlled. Solar energy can be produced at €40 to €70 per MWh over more than 20 years.

At the end of 2017, Denmark, which has fewer hours of sunshine than France, had installed power plants with a total surface area in excess of 1,300,000 m², mainly on heat networks. In comparison, in France only five heat networks are equipped with solar power plants, and they total less than 10,000 m². The technology is struggling to gain a foothold on industrial sites where heat at temperatures below 150°C accounts for some 20% of consumption. The main sticking point is the long-term commitment required.



Support from the Heat Fund

ADEME's "Major solar thermal installations" RFP was launched specifically to trigger the development of an industry supplying competitive energy solutions. It opens up eligibility for the Heat Fund, managed by ADEME since 2009, which offers concrete support for the development of renewable heat production (for collective residential buildings, local authorities and businesses).

"This outstanding solution from Kyotherm and Boortmalt at Issoudun proves that Centre-Val de Loire has the capability to accommodate very large scale projects. With our region's industrial history, the strength of local businesses and the collective awareness of the importance of the energy and ecological transition, we are all set to go further faster. In view of this, ADEME is keen to talk to any entity with an innovative project to propose."

Mohamed Amjahdi, Regional Director, ADEME Centre-Val de Loire



ABOUT THE PARTIES INVOLVED



ADEME, the French Environment and Energy Management Agency, is involved in implementing public policy in the areas of the environment, energy and sustainable development. It offers advice and expertise to businesses, local authorities, central government and the public to help them reduce their impact on the environment. It is involved in financing projects, from research through to implementation, in the following areas: waste management, soil conservation, energy efficiency and renewable energy, air quality and noise reduction.

It aims to disseminate its knowledge as widely as possible, prompt changes in behaviour and assist public and private operators in implementing the public policies it supports.



Boortmalt, an Axereal cooperative subsidiary, produces high-quality malts for brewers, distillers and micro-brewers. As the world's no. 4 maltster, Boortmalt operates 10 malting plants in Europe and produces and sells more than a million tonnes of malt a year. Boortmalt uses its strategic site at Antwerp to export 50% of its total production to emerging markets. A market leader in the United Kingdom and Ireland, it is a prominent producer of whiskey and speciality malts.



Kyotherm is an equity investor specialised in financing and structuring renewable heat production and energy-saving projects. It has financed projects equivalent to over 53 MW, with fourteen projects currently operating and three under construction. They include geothermal, biomass, heat pump, fatal heat recovery and solar thermal solutions, as well as energy performance contracts.

Kyotherm uses its expertise and the experience acquired during previous projects to optimize the cost of capital and thereby control energy costs. While projects of this type are highly economical to run, the initial investment required is substantial.

Using third party financing for these projects means that the companies consuming the energy can conserve their financing capacities for their core businesses, and technical solutions providers can offer their clients turnkey energy solutions.

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