



# Solar Thermal Heat

**C**urious about what you are looking at? This is one of the newest ISES Infographics on solar thermal heat..

**ISES** – the International Solar Energy Society – publishes infographics like these to highlight the real value solar and other renewable energy sources have in fighting climate change and how these technologies are already being applied in the production of different products we use on a daily basis. To learn more and discover the other infographics of this series visit us at [ises.org](http://ises.org).

## SOLAR THERMAL HEAT FOR MINING

The extraction of raw materials for the electronics we use daily is a thermally intensive process. Mined minerals, like lithium for batteries and copper for electrical wires, must be broken down, heated for separation, and dried to create their final product. This all requires energy which can easily be provided by solar thermal energy. Best of all, it is already being done at a massive scale in Chile.

### TAKE A LOOK AT THE GABY COPPER MINE IN THE ATACAMA DESERT

It has installed nearly 40,000 m<sup>2</sup> of solar thermal collectors to support the electrolytic refining process of copper, making this solar project larger than 12 soccer fields.



## BREWED BY THE SUN



## SOLAR THERMAL HEAT FOR BEER BREWING

The beer brewing process requires many steps to produce your favorite after-work or weekend drink. Many require some degree of thermal energy, either to pre-heat brewing water, cook the ingredients together, or prepare hot water for cleaning. For example, numerous breweries around Germany and Austria use solar thermal energy as a core energy component in their beer brewing process. They have done this not only for the environment, but because it's simply the lower cost option.

### TAKE A LOOK AT THE HOFMÜHL BREWERY IN EICHSTÄTT, GERMANY:

For over a decade, they have been using solar thermal panels to run their brewing process, covering over 60% of their annual energy needs. They even brew a "Solarbier" (or "Sun Brewed Beer") that is fully produced with renewable energy.

## SOLAR THERMAL STEAM FOR PHARMACEUTICALS

Covering another essential part of our day-to-day lives, solar thermal heat is also used to make steam. This plays a significant part in many industrial processes such as the production of pharmaceuticals, an industry with a substantial energy demand.

For the production of pharmaceuticals, solar thermal heat is used to create steam as water is pumped through the solar thermal collector field, where it partly evaporates due to the concentrated solar irradiance. This "solar steam" is then stored in a steam drum and is released to the factory through a pressure-controlled valve within the manufacturing processes.

One highly successful example of solar steam for industrial processes is the located in Amman, Jordan. Here, RAM Pharma installed a Direct Steam Generation System in 2015, helping to offset use of its diesel fired steam boiler.

This new system provides up to 340 mega-watt hours per year, reducing diesel consumption by 42% while simultaneously buffering the demand fluctuations and reducing the need for the complex via rooftop shading (where the collectors are installed).

This award-winning project, the first of its kind in the MENA region, is a great example of the massive benefits solar steam can have in industry processes!

