

# Greenhouse solar plant for cheaper extraction of oil

March 2 2011, by Lin Edwards

---



(PhysOrg.com) -- A Californian company has found a way to reduce the cost of making steam for use in extracting oil from old oil fields: they heat the water using free sunlight.

The new demonstration solar thermal steam plant at McKittrick in California uses sunlight concentrated by mirrors in a greenhouse to pre-heat water. [Natural gas](#) is then used to boil the hot water to produce

steam to heat the rock in the old oil field in order to scour out more oil and melt the thicker and heavier oils and extract them. In a full-scale plant the mirrors could be used to produce the steam, but in the pilot the wellhead is too far away from the greenhouse for piping the steam to be practical.

Vice president of business development at GlassPoint Solar, John O'Donnell, explained that producing steam is the largest cost in thermal extraction of oil. He said that with the solar assistance they can get 10-20 percent more oil from the same well because the cheaper steam means you can run the extraction longer.

The demonstration plant covers an area of 650 square meters among the derricks of the oil field, which is owned by the Berry Petroleum Company. The plant consists of a greenhouse with a crenellated roof to maximize the exposure to sunlight. Two rows of seven-meter-wide mirrors are suspended from the top of the greenhouse and concentrate the sunlight onto tubes containing the water. The mirrors generate about a million British thermal units (BTUs) of heat each hour. The amount of steam needed depends on the age of the oil field, but is typically around two million BTUs per barrel of oil.

GlassPoint Solar says the steam can be produced at a cost of \$3 to \$3.50 per million BTUs, compared to around \$4 per million BTUs with natural gas. Costs are also reduced because the greenhouse blocks the wind, which means lighter components can be used than in traditional solar thermal mirror systems (mostly used to make steam to drive generators) and the steel supports are no longer needed.



The greenhouse is at higher pressure than the outside, which prevents dust from collecting on the mirrors. The glass of the [greenhouse](#) is kept clean using conventional automatic water sprayers as used in agricultural greenhouses, and the water is re-used.

A solar thermal power project being built by BrightSource Energy has been under construction since 2009, but the GlassPoint pilot plant took only six weeks to build. O'Donnell said a full scale plant could be built quickly.

Around 40 percent of Californian oil is extracted using steam heated by natural gas, and [oil](#) extraction is the greatest industrial use of natural gas in the state.

**More information:** [www.glasspoint.com/](http://www.glasspoint.com/)

© 2010 PhysOrg.com

Citation: Greenhouse solar plant for cheaper extraction of oil (2011, March 2) retrieved 20 April 2024 from <https://phys.org/news/2011-03-greenhouse-solar-cheaper-oil.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.