

What are the industrial applications of solar thermal energy?

In this article, an extensive review of various solar thermal energy technologies and their industrial applications are presented. The following industries are covered: power generation, oil and gas, pulp & paper, textile, food processing & beverage, pharmaceutical, leather, automotive, and metal industries.

What is solar power?

Solar power is the conversion of sunlight into electricity, either directly using photovoltaic (PV), or indirectly using concentrated solar power (CSP). The research has been underway since very beginning for the development of an affordable, in-exhaustive and clean solar energy technology for longer term benefits.

When were solar thermal power plants invented?

Solar thermal power plants are not an innovation of the last few years. Records of their use date as far back as 1878, when a small solar power plant made up of a parabolic dish concentrator connected to an engine was exhibited at the World's Fair in Paris. In 1913, the first parabolic trough solar thermal power plant was implemented in Egypt.

Is solar thermal energy a suitable solution for process heat applications?

Heat energy is preferred as compared to electrical energy to meet the energy requirement of various applications in the process industries. Therefore, the solar thermal energy system is considered to be one of the attractive solutions for producing thermal energy for process heat applications.

What are the different types of solar power generation technology?

At present, solar power generation technology can be divided into solar photovoltaic power (PV) and concentrated solar power (CSP) (Chen and Fan 2012). Solar PV power generation utilizes photoelectric effect to directly convert solar energy into electricity, which is a direct photoelectric conversion mode.

How solar thermal system can be used in process industry?

The solar thermal system can be integrated with the central steam/hot water supply system of the process industry (Fig. 2). Apart from power generation and process heating, the solar thermal system can also be used for various applications such as air-conditioning, space heating, cooling, cooking, desalination, etc. (Kalogirou, 2004). 4.1.

The Future of Solar Energy considers only the two widely recognized classes of technologies for converting solar energy into electricity -- photovoltaics (PV) and concentrated solar power (CSP), sometimes called solar thermal) -- in their ...

energies. Solar thermal power generation systems also known as Solar Thermal Electricity (STE) generating

systems are emerging renewable energy technologies and can be developed as ...

The goal of this review is to offer an all-encompassing evaluation of an integrated solar energy system within the framework of solar energy utilization. This holistic assessment ...

In this paper, the modeling of a solar thermal energy generation plant is carried out. The climatic data correspond to two coastal cities and an island in Ecuador. The main contribution is the ...

clean energy power generation methods, solar thermal power generation can turn the traditional power grid into a technology of energy Internet because of its unique advantages. The thermal ...

1 Abstract-The present paper presents an overview of the main characteristics of a novel kind of solar thermal application called solar chimney power plant. It is a technology of electric power ...

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