

## ข่าวประชาสัมพันธ์พลังงาน

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### TSE Invested 900 Million Baht in Southeast Asia's First Concentrated Solar Thermal Power Plant

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Thai Solar Energy Co., Ltd. (TSE) has invested 900 million baht in the first concentrated solar thermal power (CSP) plant in Southeast Asia, and the world's first to do it commercially using Direct Steam Generation (DSG) technology. The Company has collaborated with several world-renowned institutes and energy experts to ensure the continuous development of thermal solar power as an alternative energy source to reduce our dependency on fossil fuel. Using Parabolic Trough Technology, the plant can generate five megawatts of electricity on approximately 150-rai plot of land located in Huaykrachao District, Kanchanaburi Province, with potential for expansion in the future. The company has planned for two new projects which will be ready in three to five years with total installed capacity expected to reach 135 megawatts.

Dr. Cathleen Maleenont, Chief Operating Officer of Thai Solar Energy Co., Ltd., said that the Company, established in 2008 with the head office based in Bangkok, is Southeast Asia's -leading company that generates - electricity from solar thermal power by using Parabolic Trough Technology, and the world's first to do it with Direct Steam Generation (DSG) in which water replaces oil as the heat transfer fluid, to make electricity generation truly clean,. -. The first plant, involving a 900-million baht investment with five megawatt generating capacity, was built in Huaykrachao District, Kanchanaburi Province, - to sell electricity to the Provincial Electricity Authority (PEA). TSE plans to enhance that capacity to nine megawatt according to the Power Purchase Agreement (PPA) which will reduce the investment cost by 20 – 30%.

TSE has 1.36-billion registered capital and its major shareholders include P.M. Energy Co., Ltd. (53%), Wave Entertainment Plc. (25%) and other shareholders (22%). Sharing the same vision, each shareholder endeavors for this inaugural project to provide a solid foundation for sustainable development in the future of renewable energy as an alternative to traditional fossil fuels, which cause

a large quantity of carbon dioxide emission, leading to greenhouse effect and rising global temperature.

In generating electricity from solar thermal energy, Dr. Cathleen added that TSE uses Parabolic Troughs to collect the solar thermal energy by focusing the solar radiation reflected from the its parabolic curved surface that are lined with a reflective material such as mirrors. This radiation is then reflected to metal tubes, called receivers, which are suspended at the focal point of the parabolic troughs, that are encased in glass which forms a vacuum environment that isolates the metal tubes from heat loss while water is circulated within the tubes and absorbing the energy that is focused upon it. The water will eventually turn into super-heated steam, 330 degrees Celsius at 30 bars, which then powers a turbine connected to a generator to generate electricity.

From the turbine, the steam is converted back into water via condensing and cooling systems and re-circulated back to the parabolic troughs and receivers in the solar field again for re-use in a closed-loop system so water loss is very minimal.

This type of system (CSP) can be further expanded in line with the increase in current energy storage technologies now available to store excess unused superheated steam in the daytime for use to run the plant into the night purely on stored energy from the sun. A heat-storage system will be introduced in the next phase for this plant. This technology is used in European countries, as well as in the United States-" said Dr. Cathleen.

TSE aims to enhance the capacity in compliance with more than 10 power purchase agreements it has. Currently, it is launching one project and three more are under construction. In additional, the Company plans to increase the investment with business partners by spending one billion baht earned from the capital increase in August and more project financing from commercial banks in the country.

Dr. Cathleen added that when running at full capacity, TSE's revenue per megawatt is expected to reach 20 to 30 million baht annually. Within two years, TSE should expand that capacity from 5 to 35 megawatts. Currently, the first plant can increase the generating capacity from five to nine megawatts. The second, third and fourth plants in Suphanburi and Kanchanaburi Provinces are under construction and all are nine megawatt plants. Furthermore, TSE plans for more construction since the existing power purchase agreement with the Provincial Electricity Authority allows the Company to generate over 45 megawatts. The expansions will possibly include joint ventures with other business partners. In total, TSE expects to increase the capacity to more than 135 megawatts within three to five years.

The growth rate of electricity generation business from solar power is very promising since the raw material has no cost and is renewable when compared to other conventional fuels. Renewable energy is rapidly developed with promising growth in European countries with significantly improved technology coupled with strong support from governments such as Germany.

"Readily available electricity is a crucial public utility for the economy to grow and the demand is increasing. Over 70% of electricity generated in Thailand, which is a high ratio, is generated from natural gas. If this continues, natural gas will be available for just over 20 more years. Using renewable energy is therefore essential - because it is the bright new hope for the future," concludes Dr. Cathleen.

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