

**Full-scale Entry into Solar Thermal Energy Plant Business  
– Steam Recovery Demonstration Experiment of Integrated System from  
Heat Collection to Power Generation Successfully Completed –**

1 September 2010

JFE Engineering Corporation

Mitaka Kohki Co., Ltd.

JFE Engineering Corporation\*<sup>1</sup> and Mitaka Kohki Co., Ltd.\*<sup>1</sup> jointly succeeded in performing a steam recovery demonstration experiment using a heat receiving system (receiver) for a collector tower type of solar thermal energy plant.

#### Background of Development

Solar thermal energy is attracting attention for generating power more efficiently than photovoltaic power, while using renewable energy that emits no carbon dioxide. JFE Engineering and Mitaka Kohki have been developing a high-efficiency heat receiving system (receiver) that uses a high-efficiency sunlight collection system developed by Mitaka Kohki.

#### Outline of Experimental Equipment

Site of experiment : Mitaka City, Tokyo Metropolis

Height of tower : 10 m

Heliostat : 500 mm diameter x 4 plates/unit x 72 units

Sunlight collection method : Two methods: sunlight is collected either at the base (beam-down method) or at the top (tower-top method) of the tower.

Solar heat collected : 57 kW

#### Major Related Technologies Owned by the Two Companies

JFE Engineering:

Steam turbine and other energy plant technology:

Technologies related to power generation plants (steam turbines, gas engines, etc.) and boilers

Steel plant technology:

Steelmaking technology is applied to the solar concentrating collector.

Mitaka Kohki:

Technologies related to the high-efficiency sunlight collection system (heliostat):

Celestial automatic tracking technology based on astronomical telescope fabrication and high-accuracy sunlight collection technology based on sophisticated optical technology.

Results of Demonstration Experiment

- Successful experiment for the continuous and stable collection of high-density solar energy.
- Developed a high-efficiency steam generating receiver, combining boiler technology with sophisticated heat recovery technology based on high-temperature process technology for steel plants.
- Successfully recovered more than 70% of solar energy as steam.

Integrated Plant from Heat Collection to Power Generation

Combining the technology developed this time with the steam turbine and power generation technology owned by JFE Engineering, a completely domestically-made power generation plant is now available that integrates all the systems, from heat collection and receiving, to power generation. Further, the Hybrid Solar Combined Cycle (HSCC) using the high-efficiency gas engine power generation technology owned by JFE Engineering can be incorporated to overcome the weather dependency of solar thermal energy generation.

Future Development

Demand for solar thermal energy plants is expected to exceed two trillion yen per year<sup>\*2</sup>, particularly in the "sun belt" regions<sup>\*3</sup>. By combining the technologies of the two companies, we will develop and design a commercial plant and aim to win the first order within this fiscal year ending 31 March 2011.



Overview of experimental equipment

Notes:

\*1: JFE Engineering Corporation

Address : 2-6-2, Otemachi, Chiyoda-ku, Tokyo

President and CEO : Sumiyuki Kishimoto

Established : April 1, 2003

Capital : 10 billion yen

Business : Engineering business related to energy, urban environment, steel structures, industrial machinery, recycling, etc.

Mitaka Kohki Co., Ltd.

Address : 1-18-8, Nozaki, Mitaka City, Tokyo

President and CEO : Katsushige Nakamura

Established : 1966

Capital : 10 million yen

Business : Manufacture and sale of high-accuracy astronomical telescopes, optical measurement devices, medical devices, etc.

\*2: The global market for solar thermal energy plants is estimated to reach 170 trillion yen by 2050 (estimated by JFE Engineering,

assuming equipment cost of 300,000 yen per kW).

Regions where solar radiation is intense and daylight hours are  
\*3: long such as North Africa, Middle East, Southern Europe,  
America, and Australia.

For further information, please contact:

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