

**A Compilation of Advanced Solar Energy Power Generation Technologies
at the Yokohama Head Office
– Announcing the Completion of JFE Engineering’s Solar Techno Park –**

5 October 2011

JFE Engineering Corporation

JFE Engineering Corporation (President: Sumiyuki Kishimoto; Head Office: Chiyoda-ku, Tokyo) completed construction of the Solar Techno Park at its Yokohama Head Office (Tsurumi, Yokohama) as a base for promoting technical development of power generation using solar energy, and unveiled the facility on October 5. The Opening Ceremony was held on the grounds of the Solar Techno Park on October 5, with a number of distinguished guests in attendance, including members of the Japanese Diet, officials from the central government and Yokohama City, and representatives of many embassies, beginning with the Minister of the Australian Government. The visitors showed keen interest in this new facility.

Implementation of countermeasures for global warming began in various countries several years ago, and solar energy has attracted much interest from this viewpoint. However, the earthquake and nuclear power plant accident in Japan in March spurred a general review of energy policies in countries around the world, and focused renewed attention on solar energy as an alternative to nuclear power. Against this backdrop, JFE Engineering planned a technology development base for solar energy power generation in Yokohama, and constructed this facility as a center for disseminating the innovative technologies developed there at the global level. It is also the first facility in Japan which brings together various technologies for photovoltaic and solar thermal power generation in one location, and conducts research and development on those technologies.

JFE Engineering has constructed advanced demonstration plants for various solar technologies at its new Solar Techno Park, in particular, tower-type concentrating photovoltaic (CPV), tower-type concentrating solar power (CSP), and linear Fresnel-type CSP, which have attracted attention as next-generation solar energy power generation technologies.

Among these, early commercialization of the tower-type CPV plant, called HyperHelios, is expected. HyperHelios is an advanced technology which targets the following performance in comparison with the conventional silicon-type solar panel technology in Japan.

- Cell generating efficiency 2 times greater than conventional technology
- Generating capacity per unit area 1.5 times greater
- Equipment cost/kW 25% lower
- Generating cost/kWh 30% lower

Linear Fresnel CSP has already been commercialized, and JFE Engineering is currently expanding its marketing efforts, focusing on overseas markets. Although solar thermal power is not included in application of the existing FIT (Feed-In Tariff) system in Japan, inclusion is expected in the future.

JFE Engineering is promoting technology development at the Solar Techno Park, and in the future, will develop these technologies both in Japan, particularly in the area affected by the recent earthquake and tsunami, and overseas, in sunbelt regions of Australia and other countries.

The company is targeting sales of ¥50 billion or more in the solar energy power field by FY2015.

Outline of Facilities at Solar Techno Park

[Tower-type concentrating photovoltaic (CPV) power system: HyperHelios]

This is a direct-type power generating system which concentrates sunlight on a receiver (multi-junction solar cell with a secondary light-concentrating function) installed atop a 20 m tower using heliostats (mirrors which track the sun).

In a project commissioned by Japan's Ministry of the Environment, research and development is underway on stable light concentrating and cell cooling technologies, aiming at establishment of a power generating technology under a sunlight concentration ratio of 1000.

At the same time, JFE is also improving the technology for cost reduction by using a new type of large-scale heliostat, while maintaining high accuracy concentrating

performance.

Within the current fiscal year, JFE plans to upscale the power generating capacity of the Solar Techno Park facility to the 40-60 kW scale.

- The company plans MW class demonstration tests in Japan and other countries beginning in 2012 and commercialization in 2013.

[Tower-type concentrating solar thermal power (CSP)]

This technology, like the HyperHelios CPV system, uses heliostats to concentrate heat on a receiver (heat receiving device) installed atop a tower. This heat is used to generate high temperature, high pressure steam which drives a turbine-generator system.

- During the current fiscal year, JFE will carry out technical development of receiver and heat storage technologies as original JFE Engineering technologies, in order to recover steam with higher efficiency

- The company is targeting demonstration of 2.5 MW plants overseas during FY2012.

[Linear Fresnel concentrating solar thermal power]

- JFE introduced this technology from Germany's SPG (Solar Power Group) in May 2011.

This is a technology which generates steam by concentrating solar heat on collecting tubes arranged above plane-shaped concentrating mirrors, which are installed horizontally at a height of 2 m above the ground.

- In comparison with the conventional parabola type, the linear Fresnel type is relatively unaffected by wind and has a simple structure, realizing low cost.

- To reduce power generating costs, JFE has made an engineering proposal to upscale the equipment for use at existing coal-fired thermal power plants as steam generating equipment.

- At the same time, JFE plans to implement technical improvements to improve light-concentrating accuracy at Solar Techno Park, aiming at further cost reduction.

For further information, please contact:

Solar Energy Power Project Team

Green Project Sector

JFE Engineering Corporation