



NEWS RELEASE

Solar Frontier Manufactures 14.6% Efficiency CIS Module

*Champion module manufactured on mass-production line
closes the gap with polycrystalline silicon*

Tokyo, June 18, 2013 – Solar Frontier’s latest champion module from its flagship Kunitomi Plant in Miyazaki, Japan, has achieved 14.6% conversion efficiency. The rated capacity of this 1257mm x 977mm module has been certified by Underwriters Laboratories Inc. (UL) at 179.8W.

This achievement is at the same level* in terms of efficiency as mass-marketed polycrystalline silicon modules. Solar Frontier’s success in manufacturing this new CIS module on a production line at the Kunitomi Plant suggests an accelerated outlook for transferring this technology to full mass production.

2013 marks the 20th anniversary of R&D on CIS technology at Showa Shell Sekiyu, Solar Frontier’s parent company. Other recent milestones include the world’s highest aperture area efficiency of 17.8% for a 30cm x 30cm CIS Solar module, and a world-record energy efficiency of 19.7% for a cadmium-free CIS solar cell (approx. 0.5 cm²).

CIS technology has the potential to achieve even higher energy conversion efficiency, and there is also room for further production cost reductions. Solar Frontier’s manufacturing process requires a lower quantity of raw materials and energy, which also means its CIS solar modules have a lower environmental impact. The higher efficiencies strengthen the competitive edge of a CIS solar module that is rapidly gaining a reputation for higher actual output in real world conditions.

“Champion modules are a key validation of technology transfer from Solar Frontier’s laboratories,” said Solar Frontier CTO, Satoru Kuriyagawa. “This is the kind of result we look for in the production factory once we have confirmed experimental results and simulation in our pilot plant at Atsugi Research Center.”

*As of April, 2013, the conversion efficiency of polycrystalline silicon modules is considered to be around 15%, according to Shyam Mehta, Senior Solar Analyst, GTM Research in “*The module market landscape*”, GTM Solar Summit 2013.

About Solar Frontier

Solar Frontier K.K., a 100% subsidiary of Showa Shell Sekiyu K.K. (TYO:5002) (“Solar Frontier”), has a mission to create the most economical, ecological solar energy solutions on Earth. Building on a legacy of work in solar energy since the 1970s, Solar Frontier today develops and manufactures CIS (denoting copper, indium, selenium) thin-film solar modules for customers in all sectors around the world. Solar Frontier’s gigawatt-scale production facilities in Miyazaki, Japan, integrate compelling economical and ecological advantages into every module: from lower energy requirements in manufacturing to the higher overall output (kWh) of CIS in real operating conditions. Solar Frontier is headquartered in Tokyo, with offices in Europe, the U.S.A., and the Middle East. Visit www.solar-frontier.com for more information.

Showa Shell Sekiyu K.K.

Showa Shell Sekiyu K.K. is listed on the Tokyo Stock Exchange and has roots dating back more than 100 years in the downstream energy business.

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