



大阪大学 先端科学イノベーションセンター

OSAKA UNIVERSITY

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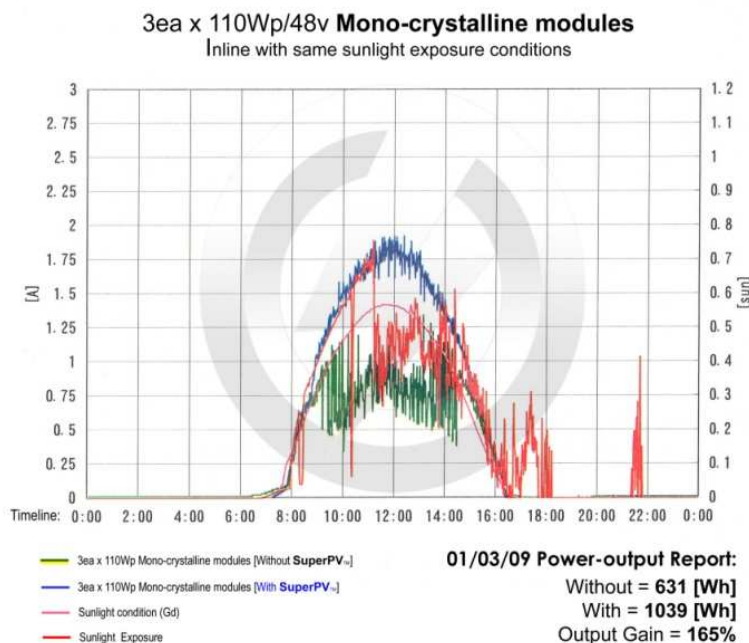
To: Super PV Technology Inc. (BVI) and Rainbow Solar Inc. (RSi) (Delaware, USA)

Letter in Admiration of “SuperPV” Photovoltaic Technology

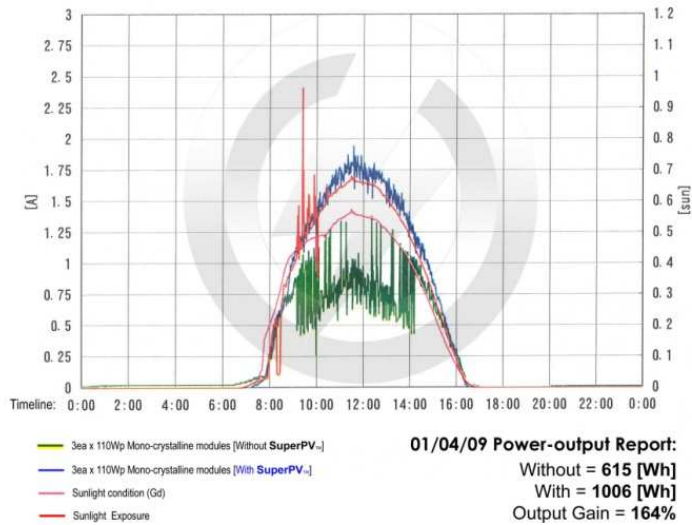
It is my honor to write a letter in admiration of the “SuperPV”, a photovoltaic (PV) power enhancer. The SuperPV is a breakthrough technology that increases the power generation of silicon solar cells by more than a 60% gain. This impressive achievement has been experimentally confirmed by Osaka University’s Center for Advanced Science and Innovation.

The Osaka study measured power output using mono-crystalline modules in series installed at Saku City, Nagan Prefecture, Japan. Solar cells incorporating the SuperPV were monitored in parallel with control cells during the period from December 27, 2008 to January 6, 2009. The results were astonishing:

1. The SuperPV enhanced modules (represented by blue lines in the following graphs) delivered daily-averaged output gains over standard modules (green lines), ranging from 161% to 165%.
2. Under low-light conditions, the SuperPV enhanced modules consistently generated a much more constant electrical output regardless of sunlight fluctuation and drop-offs (red lines) than the standard modules (green lines), which exhibited generation patterns parallel to sunlight.
3. During the peak sun periods, from 9:00 to 15:00, the SuperPV enhanced modules generated power above sunlight levels for the corresponding period.

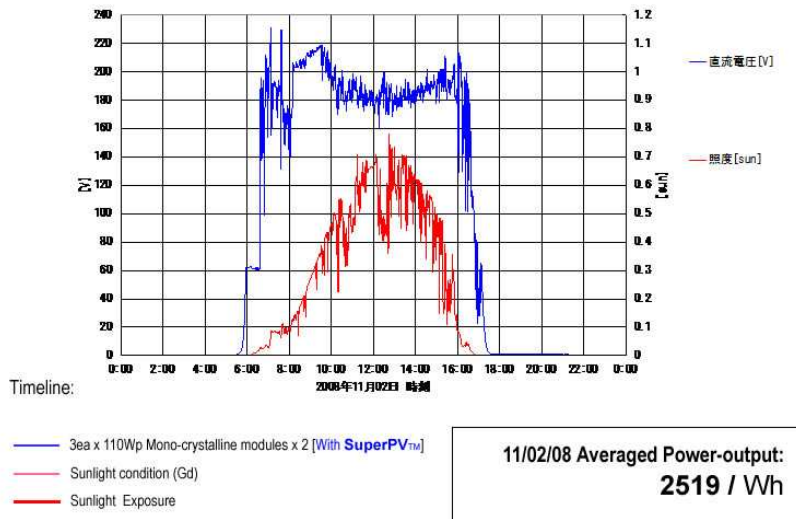


3ea x 110Wp/48v **Mono-crystalline modules**
 Inline with same sunlight exposure conditions



(Jan 1 to 4, 2009 Winter Low-Light Test Report: Red – Sunlight / Green – Standard Modules / Blue – SuperPV-Enhanced-Modules)

3ea x 110Wp x 2 sets /48v **Mono-crystalline SuperPV-modules**
 Power Output Report (Wh)



(11.02. 2008 Winter Outdoor Thermal Test Report based on a 660/Wp array with total power-output of 2519/Wh - 280%+ output gain)

Thermal analysis also revealed a cooling phenomenon on the SuperPV equipped solar cell modules. This observation suggests that installation of the SuperPV may provide the most practical solution to the overheating problem inherent in silicon based modules, that is, the loss of power and generating capacity in the presence of too much heat and light. To the best of my knowledge, the SuperPV is the only technology to have produced such results.

The SuperPV technology uses a much more accurate real-time measurement of W-h (Watt-Hour), where PV industry currently uses a less-accurate Wp (Watt-Peak) system, a projected peak-power measurement under controlled light conditions. The Osaka-University Advanced Science team helped developed new software and testing SOP to measure real-time power-output for the SuperPV laboratory.

The development of the SuperPV could not be more opportune as we approach the physical limits of silicon-based PV technology - even a 3% improvement is extremely difficult to achieve. By contrast, the SuperPV increases power output by more than 60% without any modification or stress to the module. Given its substantial benefits and broad compatibility, I expect that the SuperPV will become an integral component of all future photovoltaic modules. The implications are enormous for the photovoltaic industry: the SuperPV will enable the next generation of photovoltaics to delivery utility-class power-generation.

With worldwide patent approval, the SuperPV technology is market-ready in several product formats:

- *SuperPV Box*. An add-on box for standard solar modules, with proven output gain of 60%.
- *SuperPV Junction-Box*. A SuperPV-embedded module junction-box replacement, custom tuned and configured for each specific cell-type and module characteristic.
- *SuperPV Module*. The most powerful commercial solar module available at conventional market prices, with a 350Wp rating on a 60-cell footprint.

I expect the introduction of the SuperPV may give the PV industry pause. PV being a substantial long term investment, buyers may hold off on purchasing standard PV modules, particularly when the new technology delivers generations of improvements. The ensuing demand for SuperPV products could be overwhelming.

With two manufacturing facilities already in operation and additional production lines in development, I am pleased to learn that the developer of the SuperPV is taking responsible steps to ensure an adequate global supply, given it may become the standard technology on all future PV modules – Silicon and ThinFilm. I suspect it will be a long-time before production can catch up to market demand.

I am excited to have been one of the first to witness the birth of such a revolutionary technology as the SuperPV – rightfully named. I look forward to its broad application across all spectrums of the photovoltaic industry. In my view, the SuperPV represents a great leap forward in our mission for coping with the low-carbon reality of this new age.

Shozo Yanagida

Guest Professor (with special duty) /Emeritus Professor

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