



## CASE STUDY

## NYSP21 Conducts Performance Evaluation of Tyll Solar Thermal-PV Panels

Tyll Solar, LLC (Tyll) is a solar energy Research & Development Company focused on global potential for solar innovation and technology transfer. Assisting strategic partners to deliver more energy at lower cost, Tyll aims to become a significant contributor to the reduction in fossil fuel use for residential and commercial structures.

### Challenge

Tyll has developed and produced a combination PV-thermal solar panel that effectively applies the combined heat and power concept to solar energy. Traditional PV panels are between 15-22% efficient, and lose a significant part of the potential energy conversion due to heat loss<sup>1</sup>. By incorporating PV solar electrical and thermal technology in a combined panel, Tyll panels provide cooling to the PV side, increasing overall energy conversion efficiency to nearly 80%. As a result, Tyll requested NYSP21 to test twelve of their prototype solar panels with and without coolant flow in order to quantify energy efficiency.

### Solution

The New York State Pollution Prevention Institute (NYSP21) worked with Tyll on evaluating the energy efficiency performance of their solar panels. NYSP21 developed and contracted the installation of a roof mounted solar test bed to evaluate Tyll's combined PV and thermal panels at the Rochester Institute of Technology (RIT). System monitoring sensors were installed and interfaced with a central data acquisition system at the test site that recorded environmental conditions, panel temperatures, pressures, electrical output and system flowrates.

### Results

The results identified from NYSP21's work will assist Tyll to further develop, optimize and commercialize their system, and support product manufacturing in New York State.

- Tyll's thermal-PV panel produced photovoltaic electric power output comparable to expected performance for a conventional PV panel.
- The panels exhibited good fluid sealability over the course of the testing.
- Based on thermal imaging at RIT, Tyll's panels are capable of reducing the photovoltaic surface temperature at least 10 degrees Celsius at the flowrates tested.
- Tyll's prototype system installed at RIT produced both electrical and thermal power as predicted by the design models.

### Testimonial

*"NYSP21, through the Golisano Institute for Sustainability at RIT has been strongly engaged in our development work for over a year. The team provided engineering design services, detailed fluid performance modeling and the construction of our prototype test bed on their roof. The data from that system has provided important design validation in terms of both ease of installation and actual energy performance, both important milestones as we prepare to go to market with this product."*

- Stephen P. Shea, Consulting Engineer; Tyll Solar, LLC

<sup>1</sup><http://www.tyllsolar.com/about.html>

### CHALLENGE

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### SOLUTION

- NYSP21 developed and contracted the installation of a roof mounted solar test bed to evaluate Tyll's combined PV and thermal panels at the Rochester Institute of Technology

### RESULTS

- The work performed by NYSP21 will lead to further development, optimization, and commercialization of Tyll's panels, and support product manufacturing in New York State



## NYSP21 PARTNERS



New York Manufacturing Extension Partnership

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