

A **SUCCESS** STORY

PHOTOVOLTAIC CELLS MORE **RESISTANT** TO HIGH TEMPERATURES


Hybrid photovoltaic (PV) and thermal power plants hold many advantages in isolated areas, or in an industrial context that produces large volumes of usable thermal energy. The photovoltaic cells used in this context are subject to very high temperatures that can reach more than 200°C. There are very few detailed studies on their behaviour above 100°C. It is essential that we better understand the phenomena that determine their performance at such high temperatures in an effort to improve long-term reliability. That was the goal of a collaborative project undertaken by **Prof. Vincent Aimez** at the **Université de Sherbrooke**, along with two Canadian SMEs, Sudbury's **Crystal Green Energy** (CGE) and **Rackam**.

For both industrial partners, a fundamental analysis of the evolution of materials under thermal stress became essential when identifying the most suitable materials and encapsulation strategies for solar photovoltaic-thermal hybrid applications. Field testing also provided early insight into potential failures and reliability issues. Access to high-level "solar photovoltaic-thermal hybrid" experts who can demonstrate the manufacturing of very high-efficiency, high-temperature solar cells are essential to the development of future hybrid cells.

The work that was carried out during this project paved the way for new partnership projects that can support the commercialization of hybrid/high-temperature systems. Robust solar cells were achieved using an optimized ARC (Anti-Reflective Coating) that covers the ohmic contact linked to the appropriate contact alloy. A demonstration of a gold-free metallic contact operating at temperatures of up to 250°C also led to a number of applications.

 *We are very satisfied with the work that was accomplished during this project. The meetings were fruitful and included a bilateral sharing of results. The research team was responsive and understood our business context. PRIMA was able to create value at every stage.*

We appreciated PRIMA's guidance, along with their clear direction and advice.

This helped us focus on technology development rather than excessive and tedious paperwork. 

- **Christian Dubuc**,
Rackam



SECTORS

Electronic
Energy
Telecommunication



APPLICATIONS

Renewable energy
Microelectronics



TRL

1-3



DURATION

24 months
(2016-2018)