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Title

CRADA Final Report: Process development for hybrid solar cells

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CRADA No. UFCRA006216

LBL Report Number _____

1. Parties: Rosestreet Labs Energy, Inc.
(Identify Parties to the CRADA)
2. Title of the Project: Process development for hybrid solar cells
3. Summary of the specific research and project accomplishments:
The project was initiated on 6/12/09. Project funds were devoted to achieving a major technical breakthrough, demonstrating experimentally for the first time a working III-nitride/Si two junction tandem cell. This work was published (12/09) in [Applied Physics Express](#).
4. Deliverables:

Deliverable Achieved	Party (LBL, Participant, Both)	Delivered to Other Party?
10 undoped wafers with InGaN test structures per Statement of Work	RSLE	Yes
10 Mg-doped wafers with InGaN test structures per Statement of Work	RSLE	Yes
20 wafers with full tandem solar cell test structure per Statement of Work	RSLE	Yes

5. Identify publications or presentations at conferences directly related to the CRADA?
L. Reichertz, Iulian Gherasoiu, Kin Man Yu, Vincent M. Kao, Wladek Walukiewicz, and Joel W. Ager III, "Demonstration of a III-Nitride/Silicon Tandem Solar Cell," *Appl. Phys. Express* **2** 122202 (2009).

Results were also presented by W. Walukiewicz in an invited presentation of the Fall Meeting of the Materials Research Society 2009, "Applications of Group III-Nitride Alloys for Solar Power Conversion."

6. List of Subject Inventions and software developed under the CRADA:
(Please provide identifying numbers or other information.)
7. A final abstract suitable for public release:
TCF funding of a CRADA between LBNL and RSLE leveraged RSLE's original \$1M investment in LBNL research and led to development of a solar cell fabrication process that will bring the high efficiency, high voltage hybrid tandem solar cell closer to commercialization. RSLE has already built a pilot line at its Phoenix, Arizona site.
8. Benefits to DOE, LBNL, Participant and/or the U.S. economy.
The solar cell's target market is the high performance sector for photovoltaics, a market particularly suited to applications in constrained areas such as industrial rooftops and mobile devices. RSLE expects to capture 1% of the \$34B global market. By reaching their target efficiency of 30%, the hybrid tandem solar cells have the potential to reduce the cost of concentrator photovoltaic power generation (CPV) by 10-15%--an improvement that could lead to adoption and implementation of this carbon-neutral energy source on a large scale.
9. Financial Contributions to the CRADA:

DOE Funding to LBNL	\$100k
Participant Funding to LBNL	\$0k
Participant In-Kind Contribution Value	\$100k
Total of all Contributions	\$200k