National Renewable Energy Laboratory
A national laboratory of the U.S. Department of Energy
Office of Energy Efficiency & Renewable Energy
Innovation for Our Energy Future

Ink Jet Printing for Silicon Photovoltaics

Cooperative Research and Development Final Report

CRADA Number: CRD-04-00139

NREL Technical Contact: David Ginley

CRADA Report
NREL/TP-7A1-48417
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In accordance with Requirements set forth in Article XI.A(3) of the CRADA document, this document is the final CRADA report, including a list of Subject Inventions, to be forwarded to the Office of Science and Technical Information as part of the commitment to the public to demonstrate results of federally funded research.

CRADA number: CRD-04-00139

CRADA Title: Ink Jet Printing for Silicon Photovoltaics

Parties to the Agreement: Evergreen Solar, Inc. + NREL

Joint Work Statement Funding Table showing DOE commitment:

Estimated Costs	**NREL** Shared Resources
Year 1	$ 33,000.00
Year 2	$ 10,000.00
Year 3	$ 32,000.00
TOTALS	$ 75,000.00

Abstract of CRADA work:

Evergreen Solar only has equipment suitable for testing large area cells. The spray equipment and tube furnaces at NREL are currently suitable only for small areas. However, Evergreen could use a small-area grid, and subsequent cell isolation with a dicing and cell measurement could be performed at NREL. NREL has performed work with spraying Al and Ag nanoparticles to form metal contacts to Si. They have also used metallo-organic precursors to form metal contact.

Summary of Research Results:

The purpose of this CRADA was to combine the strengths of NREL and Evergreen Solar in the area of ink jet printing to develop a new manufacturing technology necessary to produce Si solar cells based on ribbon technology comparable to or exceeding current technologies. Success was based on the achievement efficiencies equal to or superior to those made with existing technological approaches.

Subject Inventions listing: None

Report Date: 4/30/10 Responsible Technical Contact at Alliance/NREL: Ginley, David

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