The Google High Power Density Inverter Prize: Innovation in PV Inverter Power Density

Cooperative Research and Development Final Report

CRADA Number: CRD-14-568

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In accordance with Requirements set forth in Article X: Reports and Publications A.(2), of the CRADA agreement, 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.

Parties to the Agreement: Google, Inc.

CRADA Number: CRD-14-568

CRADA Title: The Google High Power Density Inverter Prize: Innovation in PV Inverter Power Density

Joint Work Statement Funding Table Showing DOE Commitment:

Estimated Costs	NREL Shared Resources
Year 1	$ 4,164.00
Year 2	$ 96,970.00
TOTAL	$ 101,134.00

Abstract of CRADA Work:

Google is encouraging development of advanced photovoltaic inverters with high power density by holding a public competition and offering a prize for the best performing high power developed. NREL will perform the performance and validation for all inverters entered into the competition and provide results to Google.

Summary of Research Results:

CE+T Power's Red Electrical Devils team won $1 million for its design of a, smaller power inverter in a competition sponsored by Google and the IEEE. Teams from Schneider Electric and the Virginia Tech Future Energy Electronics Center won honorable mentions. Google selected NREL as their evaluation partner for the project and the NREL team assisted Google with defining the contest's requirements; designing experimental configurations, test plans, and safe working procedures for the unique experiment; testing inverter prototypes from 18 finalist teams with typical solar inverter operating conditions over 100 hours; and analyzing the large dataset of results to help Google decide the winner of the contest. Shrinking inverters by an order of magnitude and making them cheaper to produce and install will enable more solar-powered homes and more efficient distribution grids, while helping bring electricity to remote areas. A key factor in the winning inverters was the use of wide-bandgap semiconductors, a technology that enables power electronics to operate at higher voltages and temperatures, allowing them to transmit more energy through a smaller volume. Read more about the competition and the winning design at http://www.nrel.gov/news/press/2016/23654.

Subject Inventions Listing:

N/A

Report Date:

February 24, 2017

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