

ARPA-E grant will fund NC State research on smart grid technologies

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A new grant from the U.S. Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) will support North Carolina State University efforts to develop new technologies essential to the development of a "smart grid" that can easily store and distribute energy from renewable sources, such as solar and wind.

The ARPA-E grant is for a total of \$5.15 million over three years, the bulk of which will be going to Cree, which is leading the initiative. Partners in the initiative include NC State, ABB and Powerex. NC State will receive \$750,000 over the life of the grant.

NC State's role is to develop a transformerless intelligent power substation (TIPS), says Dr. Subhashish Bhattacharya, an assistant professor of electrical and computer engineering at NC State and primary investigator for the university on the grant project. "TIPS will enable the vision of the smart grid," Bhattacharya says. "It will be a more cost-effective and efficient means of connecting renewable energy resources to the existing power infrastructure."

Specifically, Bhattacharya explains, TIPS will enable the direct interconnection of renewable energy resources and energy storage systems to the grid with bidirectional power flow control. It will also provide energy management, and improve grid power quality and reliability through enhanced communication. Dr. Alex Huang, professor of electrical and computer engineering, is a co-primary investigator on the NC State component of the grant.

The NC State TIPS development project will be made possible by the work that Cree will be doing under the grant — developing a power semiconductor device based on silicon carbide.

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