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Enhanced Systems Consulting of ETSU's Innovation Lab receives Department of Energy grant

JOHNSON CITY — Enhanced Systems Consulting (ESC) has received one of 126 Small Business Innovation Research Grants from the U.S. Department of Energy.

Working in partnership with Bristol Tennessee Essential Services (BTES) and East Tennessee State University (ETSU), ESC received the award for a unique approach and solution to addressing Smart Grid Energy Management and related issues. The jointly developed Dynamically Controlled Electric Demand Management System (DCEMS) will be ready to market during 2012. The Phase 1 grant has a maximum value of \$150,000 to enable the development of DCEMS software. The group can then apply for a Phase II grant of up to \$2 million.

ESC President Matthew Bolton explains, “The software will build a local, or micro-grid, management solution for distributors, as well as the large scale utility-wide solution for generators such as the Tennessee Valley Authority (TVA).”

Using the BTES electrical grid and the company's capability to communicate with each individual home in the area, DCEMS software will monitor and manage key electrical appliances within homes.

BTES CEO Dr. Michael Browder notes, “Our dedication to providing the most value and sustainability to our customers has led us to many new and innovative offerings over the last 20 years. This is a very important and exciting opportunity for BTES.”

Initially, DCEMS will monitor and maintain up to 5,000 residential smart water heaters by checking the real time usage and voltages of each home using Carina Technology's, Inc. Water Heater Information Solution for Energy (WISE) Smart Water Heater controls. The unique capabilities within BTES implementation provide ESC with the ability to turn on and off any smart water heater independently of the other 4,999. BTES currently controls 10,000 additional water heaters that do not have smart controls with a paging system. The goal is to replace these with smart controls in the future to expand the total number of smart water heaters to 15,000.

During TVA defined peak load hours, DCEMS software can temporarily turn off any or all water heaters to minimize the electricity being used. At the same time, the temperature of the water will be monitored to ensure each customer has hot water available whenever it is needed.

Another software component will recharge the water heaters over non-peak usage time to minimize BTES and consumer costs.

In addition, the software can manage and monitor real time voltage being delivered to a home or business by dynamically turning on and off electricity delivery capacitors already installed in the BTES grid.

A final component involves the expansion to other appliances and usages, including electric car recharging and phased-in activation of major users when a power outage occurs.

Dr. Bill Duncan, ETSU's Vice Provost for Research, says, "ETSU is pleased to be part of the BTES and ESC partnership to develop a Smart Power Grid Control Software Platform for Closed-Loop Energy Demand Management System. With the ESC software platform and the BTES 'fiber-rich pre-qualified data site designation' and electrical power distribution and service system, we essentially have a living laboratory where our students can benefit from sustainability projects that demonstrate the need for a blending of business models and innovative technologies."

Bolton adds, "Without all three partners and their respective areas of expertise, this opportunity would have never arisen. ETSU provides the expert resources necessary to coordinate the Research and Innovation Grant process. BTES offers the perfect electric grid technology and communications capabilities, as well as the innovative commitment to providing sustainable delivery of electricity and communications in the future. ESC contributes software and integration solutions, knowledge and expertise accumulated during more than 20 years in business."

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