

Carnegie Mellon University to collaborate with Semiconductor Research Corporation to help bring more energy efficient systems and technologies to the marketplace

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PITTSBURGH—Carnegie Mellon University will host a new Smart Grid Research Center as part of a \$5 million industry-academic partnership with the Semiconductor Research Corporation (SRC), the world's leading university-industry research consortium for semiconductors and related technologies.

The new partnership, dubbed the Energy Research Initiative (ERI), will team companies from across the energy-related spectrum with university researchers to address the world's need for smart alternative energy sources and prepare students with the technical skills required for the new burgeoning industry. The ERI, managed by SRC subsidiary The Energy Research Corp. (TERC), will initially address two critical areas for efficient generation and distribution of renewable energy resources: photovoltaics and systems engineering and technologies to enable and optimize smart grids. It is the latter, "Smart Grid Research Center," that will be housed at Carnegie Mellon.

Pradeep K. Khosla, university professor and dean of Carnegie Mellon's College of Engineering, said the new initiative is designed to develop reliable, affordable, secure, clean and efficient energy systems and help provide students with the expertise and skills needed to move these new technologies into the marketplace.

"The Smart Grid Research Center at Carnegie Mellon will support the incorporation of renewable energy resources and provide modeling, simulation and control tools needed to manage, optimize and secure the power grid," said Ed Schlesinger, head of Carnegie Mellon's top-ranked Electrical and Computer Engineering Department. Marija Ilic, a professor in Electrical and Computer Engineering and Engineering and Public Policy at Carnegie Mellon and director of the university's Electric Energy Systems Group, will be the director of the Smart Grid Research Center.

Ilic said the Smart Grid Center is driven by the vision that it is critical to transform today's operating and planning industry practices to serve much more complex objectives than in the past.

"Smart Grids are needed to enhance sustainability, which is a careful tradeoff between reliability (lights staying on), short-and-long term efficiency (cost of electricity), greenhouse gas emissions reduction (clean world) , and financially sound innovation, and deployment of unconventional technologies that will help create employment opportunities," said Ilic. "For these objectives to co-exist, it is critical to engage in multidisciplinary engineering systems of smart grids."

Instead of relying on worst- case designs, much can be achieved by transforming electricity service into just-in-time (JIT) and just-in-place (JIP) services, according to Ilic.

Ilic also reports that a smart grid could eliminate some of the widespread problems like blackouts that have plagued many of the nation's aging systems and caused economic hardship for users. "There's a lot of talk about upgrading equipment, but what we really need is to upgrade other things, like computer programs and communications that make it all work," said Ilic. "The timing is right since utilities are pursuing major pilot projects to deploy sensor and measurement technologies necessary to implement new types of electricity services."

Carnegie Mellon researchers are already working toward Dynamic Monitoring and Decision Systems (DYMONDS) as a means of embedding increased intelligence into different component groups and their interactions with system operators.

"The Smart Grid Research Center is dedicated to galvanizing the role of soft technologies for sustainable energy services and continued progress will require close collaboration between industry, government and academia," said Ilic.

Mark S. Kamlet, executive vice president and university provost, said the industry-university partnership is another outstanding example of Carnegie Mellon's innovative drive to help develop technologies and systems to improve industry sector operations and meet the demands of increasingly energy conscious consumers.

"The pervasive use of simulation in semiconductor process development, device design and system analysis has been called a critical factor in the success of the electronics industry," said SRC Executive Vice President Steven Hillenius. "Similar capabilities do not exist for technologies in support of solar-powered systems. Likewise, today's smart grid simulation capabilities are also limited, and new transformational approaches are required to enable significant integration of renewable energy resources into the grid."

Research will be undertaken by a global network of companies partnering with Carnegie Mellon's Smart Grid Research Center. Industry members will dedicate engineering and other resources and participate in the selection of appropriate research projects. Carnegie Mellon's Smart Grid Research Center founding members from industry include ABB, Bosch, IBM and Nexans.

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