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Carnegie Mellon Engineering Researchers Receive Grant To Improve Awareness of Electricity Consumption in Buildings

PITTSBURGH—Carnegie Mellon University’s Lucio Soibelman, H. Scott Matthews and Jose M.F. Moura received a three-year \$1.5 million grant from the National Science Foundation (NSF) to identify inexpensive ways to track energy consumption in buildings. Bosch Research and Technology Center North America (Bosch RTC-NA), the R&D arm of the global automotive, industrial, consumer goods and building technology supplier, will assist with the broad-based project to track energy consumption.

“This research grant gives us a timely opportunity to begin exploring electricity consumption on a variety of levels and to eventually develop tools to track the trends and patterns of energy usage and suggest ways to conserve,” said Soibelman, a professor of civil and environmental engineering at Carnegie Mellon.

The team is creating a framework for obtaining specific information about electricity use in homes and buildings.

“As household energy prices increased 70 percent between 2000 and 2007, we are committed to evaluating technologies that allow consumers better energy monitoring and efficiency. This is our goal in assisting the Carnegie Mellon researchers in this project,” said Horst Muenzel, regional president of Bosch RTC-NA.

Carnegie Mellon researchers will use a series of residential buildings, including some operated by McKeesport-based nonprofit Bluroof Technologies, to test their new hardware and software tools for electricity monitoring.

“One of the great challenges for any energy conservation is to get the right data on how to use the technology, and this new research project is designed to do just that,” said John G. Bertoty, executive director of Bluroof Technologies, which operates affordable senior citizen housing equipped with sensor networks and building automation systems to help monitor elderly residents throughout Pittsburgh.

One of the goals of the project is to develop low-cost and easy to install devices that could carefully monitor the overall consumption of the building and from that work infer the energy usage of individual appliances. The researchers plan to use the appliance-specific data to provide homeowners and building managers with suggestions on how to optimize their energy consumption and understand the effects of their energy-related decisions.

H. Scott Matthews, an associate professor of civil and environmental engineering, said the team is very excited by the project because getting information about energy use of buildings to owners is vital for the health of the planet.

As much as 40 percent of the total primary energy consumption in the U.S. is used to generate electricity. Almost 75 percent of that is consumed by commercial and residential buildings. Lighting and other easy to control home appliances, for example, account for approximately 20 percent of the electricity end use in this sector. Reducing electricity demands in current buildings, even by small amounts, can help achieve large energy-savings for the country.

“We aim to get some real-time data about how energy is used and consumed in a variety of structures and then use that data to help consumers make better decisions,” Soibelman said. “Ultimately, we want to create products that will be practical for market use.”

Researchers also plan to do a series of industry seminars and the publication of journal articles to broadcast their work.

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About Carnegie Mellon: Carnegie Mellon (www.cmu.edu) is a private, internationally ranked research university with programs in areas ranging from science, technology and business, to public policy, the humanities and the fine arts. More than 11,000 students in the university’s seven schools and colleges benefit from a small student-to-faculty ratio and an education characterized by its focus on creating and implementing solutions for real problems, interdisciplinary collaboration and innovation. A global university, Carnegie Mellon’s main campus in the United States is in Pittsburgh, Pa. It has campuses in California’s Silicon Valley and Qatar, and programs in Asia, Australia and Europe. The university is in the midst of a \$1 billion fundraising campaign, titled “Inspire Innovation: The Campaign for Carnegie Mellon University,” which aims to build its endowment, support faculty, students and innovative research, and enhance the physical campus with equipment and facility improvements.

About Bosch: The Bosch Group is a leading global supplier of technology and services. In the areas of automotive and industrial technology, consumer goods and building technology, some 280,000 associates generated sales of 45.1 billion euros (\$66.4 billion in fiscal 2008). The Bosch Group comprises Robert Bosch GmbH and its more than 300 subsidiaries and regional companies in over 60 countries, including sales and service partners. Bosch is represented in roughly 150 countries. This worldwide development, manufacturing and sales network is the foundation for further growth. Each year, Bosch spends more than 3.5 billion euros (\$5.7 billion) or eight percent of its sales revenue for research and development and

applies for over 3,000 patents worldwide. With all its products and services, Bosch enhances the quality of life by providing solutions which are both innovative and beneficial.

In North America, the Bosch Group manufactures and markets automotive original equipment and aftermarket products, industrial drives and control technology, power tools, security and packaging technology, thermotechnology, household appliances, solar energy and healthcare products. Bosch employs nearly 24,000 associates in more than 70 locations throughout the U.S., Canada and Mexico with reported sales of \$8.6 billion in fiscal 2008. for more information on the company, visit www.boschusa.com. The Bosch Research and Technology Center North America celebrates 10 years of actively pursuing its mission collaborating closely with other North American researchers from the academic and industrial sectors. For more information, visit www.boschresearch.com.