

University Receives \$3.2M to Develop Localized Heating and Cooling Systems

The Energy Department's [Advanced Research Projects Agency-Energy](#)'s (ARPA-E) Delivering Efficient Local Thermal Amenities (DELTA) program will develop localized heating and cooling systems and devices to expand temperature ranges within buildings. The program plans to provide \$30 million to support 11 project teams in developing technologies that can regulate



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temperatures focused on a building's occupants and not the overall building. This localization of thermal management will enable buildings to operate in wider temperature ranges while still ensuring occupant comfort, which would dramatically reduce the building's energy consumption and associated emissions.

Syracuse University, led by principal investigator Professor H. Ezzat Khalifa, along with partners United Technologies Research Center, Air Innovations, Bush Technical LLC and Cornell University has been awarded \$3.2 million from DOE/ARPA-E, plus substantial cash and in-kind contributions from Syracuse University, the partners, ESD (Empire State Development) and NYSERDA (New York State Energy Research and Development Authority).

Syracuse University will develop a near-range micro-environmental control system transforming the way office buildings are thermally conditioned to improve occupant comfort. The system leverages a high-efficiency micro-scroll compressor in a micro vapor compression system, whose evaporator is embedded in a phase-change material. This material will store the cooling produced by the micro vapor compression system at night, releasing it as a cool breeze to make occupants more comfortable during the day. This micro-environmental control system could save more than 15 percent of the energy provided for heating and cooling.

The Syracuse Center of Excellence in Environmental and Energy systems played a vital role in the success of this proposal and will be a major contributor to the execution of this award.

“These new projects highlight the Department of Energy’s commitment to developing a broad range of disruptive technologies to ensure a secure, affordable and sustainable American energy future,” said U.S. Energy Secretary Ernest Moniz. “Investments in innovative methane detection and thermal management technologies demonstrate ARPA-E’s role in catalyzing energy research and development by leveraging our top scientists and engineers from across the country.”