

Solar Photovoltaic Energy Storage System for Utilization in Buildings

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Abstract

There is the need for creative, sustainable, building energy consumption designs, different from, use of traditional fossil fuels, with their associated environmental pollution. A scaled system for solar energy storage and producing electricity requirements for a typical USA family building, will be designed, constructed and tested. Major directions to proceed towards achieving zero-energy buildings for this case will be identified. A zero-energy building is where a net of zero energy is demanded from the grid, by the building, over a typical year. Research on net-zero buildings is in great demand today, but studies already performed are mostly for big and industrial buildings. Undergraduate engineering students will be involved in this project, one during the design and four during the construction phase. This will also contribute to fulfilling the requirements of their two compulsory senior courses (ME/EE 495A and ME/EE 495B). At the end of the project a graduate student will continue with research, using the system to run experiments, leading to results that will contribute to his/her thesis. The system constructed can be used for demonstrations at SIUC's, outreach to high school students on visitation to campus, because the system will be mounted on wheels to enable movement from inside the building to the outside to access the sun, and for demonstrations to the public and other students. Results from this project could be used for seeking external research grants. Broad dissemination of the results will be achieved through publications in professional journals and presentations at conferences.