

Advancement in Building Equipment Technologies: Flexible Energy Storage & Advanced Cooling Systems



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2 PM – 3 PM
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With hydrocarbon fuel prices on the rise, the last decade has seen a renewed emphasis on research to reduce the cost of operation for building equipment either through lower energy consumption or reduced demand charges. The essential need for higher performance is emphasized by the fact that building equipment consumes approximately 41% of the United States energy, compared to 30% and 29% for the industrial and transportation sectors, respectively. While intermittent renewable energy generation is growing rapidly, the need for flexible, low cost, easily scalable and dispatchable energy storage for buildings becomes more evident as means for reducing energy costs during periods of peak demand. An innovative technology for storage will be described as well as a technology for reducing energy consumption. Over the past decade, magnetocaloric refrigeration has emerged as a promising technology because it uses a zero global warming potential refrigerant and reduces energy consumption compared to conventional vapor compression technology. Magnetic refrigeration based on the magneto-caloric effect is an advanced, efficient, and environmentally friendly technology and offers a promising substitute for conventional refrigeration technology in use today.



Dr. Ayyoub Momen

Dr. Ayyoub M. Momen obtained his MS at Sharif University of Technology in Tehran. In January 2007, he came to the United States to continue his study at the University of Florida where he received his MS and Ph.D degrees in Mechanical and Aerospace Engineering Department in March 2010. Following graduation, he led 21 team members of UF's Solar Fuel Group as a Postdoctoral Research Associate to develop world-leading technologies to convert dirty coal to clean hydrogen (\$1M NETL project) as well as utilizing sunlight to make liquid fuel (\$3M ARPA-E project). In July 2013, he joined Oak Ridge National Laboratory to perform cutting edge research in the Building Equipment Research Group.

Dr. Momen has 3 patents and 2 invention disclosures and he has published more than 25 articles in peer-reviewed journals and conference proceedings.

