



Rendered wall system

TECHNOLOGY READINESS LEVEL

4-7

Seeking

Investment | Licensing | Research

Keywords

- building and wall design
- photovoltaic
- solar
- transparent walls and windows
- sustainable construction and designs

Researchers

Ali Memari, Ph.D.

Hankin Chair in Residential Building Construction

[Online Bio](#)

[Website](#)

Originating College

College of Engineering

Office of Technology Management Contact

Smith, Matthew
mds126@psu.edu
814-863-1122

Technology Summary

The disclosed invention is a new type of wall system for residential construction that is designed to have several sustainable features. The wall system is transparent for maximum daylighting use and employs photovoltaic to generate electricity. The structural system to carry gravity loads replaces conventional wood framing with recyclable metals and the sheathing material to resist in-plane shear forces replaces conventional plywood or oriented strand board with a very strong transparent material. The exterior face of the wall consists of double pane insulating glass unit that includes photovoltaic crystalline cells of thin film technology. This technology is referred to as Building-Integrated Photovoltaics (BIPV) which turn the wall into an energy-generating system, thus benefitting from the solar radiation in a robust way than the passive solar approach of thermal mass wall systems.

Application & Market Utility

The electrical energy generated by the PV unit can be used directly by the consumer, sold back to the power grid, or stored in batteries for later use. The wall is designed to be panelized modular and can be partially prefabricated or completely prefabricated. The panels can be erected at the job site using bolts as fasteners. For this reason, the panels can be reused if the building is properly disassembled. The material used for sheathing allows the wall to also be designed for military housing units with special impact resistant attribute while being transparent.

Next Steps

Seeking licensing opportunities for U.S. Patent No. 8,833,012.



Invent Penn State is a Commonwealth-wide initiative to spur economic development, job creation, and student career success. Invent Penn State blends entrepreneurship-focused academic programs, business startup training and incubation, funding for commercialization, and university-community collaborations to facilitate the challenging process of turning research discoveries into valuable products and services that can benefit Pennsylvanians and humankind. Learn more at invent.psu.edu.

Penn State is an equal opportunity, affirmative action employer, and is committed to providing employment opportunities to all qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national origin, disability or protected veteran status.