



U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

## ***Accessible, Affordable, and Energy-Saving*** **BASF Paterson Showhouse in Paterson, New Jersey**

### TECHNOLOGY HIGHLIGHTS:

Design for Accessibility

MONOTECH Wall System

Dawn Solar Hot Water System

UNI-SOLAR Photovoltaic Laminates

LEED® for Homes Pilot

In an unusual partnership, chemical company BASF is partnering with the U.S. Department of Housing and Urban Development's PATH program as part of a Better Home, Better Planet initiative. The Paterson Showhouse, which had its ground-breaking in July 2005, will demonstrate many PATH technologies and follow Zero Energy Housing (ZEH) concepts. The project will also be a pilot house for the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) for Homes rating system. LEED-H is a new USGBC product for residential buildings, comparable to the LEED-NC program for new construction of commercial buildings.



**LEED**  
for **HOMES**



BASF, one of the largest chemical companies in the world, provides architects, engineers, builders, contractors, and others in the housing and construction industry with a broad scope of materials, technical expertise, and innovative solutions to help make building products better. The company produces expandable polystyrene (EPS) foam, the rigid insulation component in a number of advanced building technologies such as structural insulated panels (SIPs), insulated concrete forms (ICFs), and the MONOTECH wall system in which a polymer-enhanced shotcrete is sprayed onto EPS, creating a structural wall. BASF worked with more than 50 of its customers and project team members to arrange for donations of products, building materials and services for the Paterson Showhouse.

Located on an empty lot in an existing neighborhood in Paterson, New Jersey, this infill project consists of a single-family home that will be fully accessible to the disabled. Grad Associates of Newark, New Jersey provided the architectural services for the project in conjunction with consulting and review by PATH and BASF. After the construction and demonstration phases of this project, the home will be donated to St. Michael's Housing Corporation, a local, nonprofit charitable organization.

St. Michael's Housing Corporation will then give the home to Richard Sosa, an 11-year-old quadriplegic, and his family. Accessible design will be integrated into all aspects of the house. A lift will be in the lower level next to the garage. This will allow Richard to have access to the main floor. In the back of the house an accessible porch will connect to a raised grade level made from the excavation of the basement. A rubber covering that is wheelchair friendly will allow Richard to access his backyard.

## Technology Selection

One of the major goals of this project was to demonstrate and promote advanced building technologies in a modest single-family home. Upon completion, this project will showcase durable and energy-efficient design and construction techniques serving as a model to promote PATH technologies to builders, developers, architects, and the public. BASF committed to implementing energy efficiency measures and technologies that promote optimum indoor air quality while PATH identified technologies that could be incorporated including:

### MONOTECH Walls (1)

The MONOTECH Building System utilizes BASF expanded polystyrene foam (EPS) as the formwork for the structural wall assembly. A fiber reinforced, polymer enhanced blend of MONOCRETE is then applied to the formwork. This assembly forms a rigid skin serving as the structural component for the final building. By using polymers in the admixture, the MONOCRETE adheres to the EPS foam when applied by spraying or troweling. In this new material, polypropylene fibers (which have not been used in concrete before) provide an increased tensile and flexural strength.

The combination of EPS foam and MONOCRETE keeps structures naturally cool in summer and warm during winter, dramatically lowering the total energy costs for home. MONOTECH wall systems offer fast, inexpensive, quality construction with high energy efficient (R-value 17-31). The walls are water, fire, and earthquake resistant containing no wood or organic materials for structure or insulation.

### Roof Integrated Solar Thermal System (2)

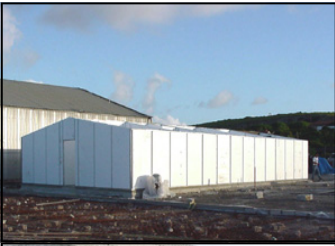
With New Hampshire-based Dawn Solar Systems, Inc., PATH evaluated a roof-integrated Dawn Solar thermal system as part of the BASF Showhouse. A standing-seam metal roof is planned for the new home. The Dawn Solar System® (patent pending) captures the heat generated by the sun shining onto the metal roof surface. Special collectors with tubing filled with antifreeze are installed under the roof to collect the solar energy radiated from the metal roofing. Depending upon location and application design, an open- or closed-loop system can be created as fluids are pumped through the system and cycled through conventional heat transfer and distribution systems.

### Roof Mounted Photovoltaics (3)

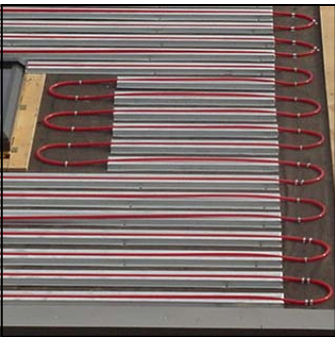
UNI-SOLAR solar photovoltaic products for residential applications include a thin laminate that can be rolled out and adhered directly to the standing-seam metal roof at the Showhouse. The unobstrusive solar PV laminates, installed over a 275-square-foot portion of the solar-collector, are part of a 1.4-kW grid-tied PV system planned for the project. Both the Dawn solar water heating system and the UNI-SOLAR PV laminates are architecturally integrated, collecting the sun's energy from a common roof area.

## Conclusion

BASF has a worldwide reputation for "making products better." Their products contribute to many key PATH technologies for more durable, affordable, and energy-efficient houses. PATH's proven building science, combined with the best new product development teams, make for an exciting demonstration project. BASF and PATH are both working with product suppliers to fulfill the project goal of 100% donated building materials. The BASF Better Home, Better Planet Showhouse project presents a unique opportunity for all of its partners to promote high performance homebuilding.



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2



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