

# PowerGuard® Photovoltaic Roofing System



## Photovoltaic (PV) Roof Tile Assembly Delivers Clean Solar Electricity to Buildings

With the help of a grant from the Inventions and Innovation Program, PowerLight Corporation has developed the PowerGuard roofing system that offers building insulation, shading, roof protection, and solar power generation encompassed in a single roofing panel. The roofing panel includes a photovoltaic module mounted on a 3-inch-thick styrofoam board coated with a proprietary, cementitious coating. Designed specifically for flat or slightly sloped commercial and industrial building roofs, the panel works as a retrofit over existing roofs, as a new roof with new construction, and for re-roofing. The system can be tailored to capacities of 1 kW or greater and allows easy expansion.

PowerGuard installations are saving energy and money from New York to Hawaii as well as overseas. A 540-kW system installed at the Santa Rita Jail in Dublin, California reduces the jail's annual energy load by over 800,000 kWh. On the opposite coast, a 186-kW system installed atop Tompkins County Public Library in Ithaca, New York generates 200,000k Wh per year despite the fact that Ithaca receives only 60% of the solar radiation compared with Southern California. Electricity demand is reduced when it is most expensive, such as during peak demand periods on hot summer days. Reducing the load during peak demand periods also decreases the threat of blackouts and other problems associated with overloading the utility grid.

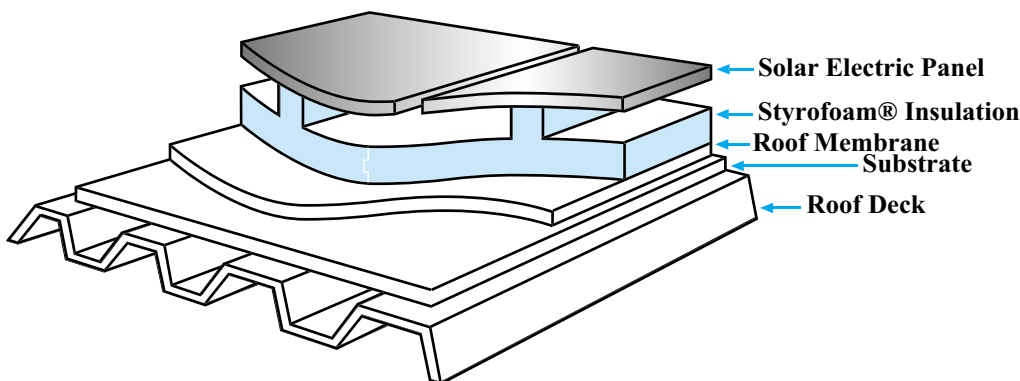
### Benefits

#### Ease of Installation

PowerGuard can tailor systems from 1 kW up to the building's peak load and offers easy expansion. The panels use a tongue-and-groove design to interlock adjacent panels for fast installation without penetrating existing roofing material.

#### Product Life

The lightweight PowerGuard system is designed to survive severe weather conditions and protects the roof membrane from harsh UV rays and thermal degradation for up to 30 years, approximately doubling the life of the roof.



PowerGuard System Cutaway View

### Overview

- ◆ Developed by PowerLight Corporation
- ◆ Commercialized in 1998
- ◆ Installations from New York to Hawaii and overseas.

### Energy Savings

(Trillion Btu)

Cumulative through 2003	2003
0.236	0.099

### Emissions Reductions

(Thousand Tons, 2003)

Particulates	SO <sub>x</sub>	NO <sub>x</sub>	Carbon
0.0	0.021	0.016	1.95

### Applications

- ◆ Installed on commercial or residential buildings that have flat or low-slope roofs
- ◆ Economic for building owners and utilities located in summer-peaking service areas where utilities offer time-of-use rates

### Capabilities

- ◆ PowerGuard is a photovoltaic power system in which the photovoltaic modules are integrated with the materials used for a building's roof.
- ◆ Feeds clean AC power into the building, displacing high daytime utility rates.