



Building Integrated Photovoltaic (BIPV) Sunshades

Technology Overview

Building integrated photovoltaic (BIPV) sunshades combine the benefits of exterior sun-shading with PV solar energy production, generating onsite power while reducing solar heat gain.

The sunshades are designed for efficiency and aesthetic quality. Angled mounting generates more energy than vertically installed BIPV and increases solar protection. Their modularity allows for individual panel installation and maintenance, limiting potential operational interference, while specially designed channels make wires accessible without sacrificing aesthetics.

Software optimizes design and system efficiency. Input data considers environmental factors and design intent, like local weather conditions or maximizing daylight and views. The output configures the best shade placement, including façade offset, panel depth, tilt angle, and length from the window head, to generate the most energy and gain the most benefit from sun-shading.

Why is GSA Interested?

BIPV sunshades can provide more area for energy generation when rooftop space is limited. The sunshades add value during times of peak demand or in locations with unreliable power infrastructure.

Occupant comfort is also improved. The BIPV sunshades reduce glare and contrast ratios, while acid-etched glass diffuses shadows from the PV panels to preserve views and quality of light.

Deployment Potential

BIPV sunshades generate energy on any side of the building, but south-facing orientations will generate the most power. Climates with high solar irradiance and hot temperatures are likely to see the most benefit from energy generation and solar heat gain reductions.

Green Proving Ground (GPG), in collaboration with the U.S. Department of Energy, is evaluating the real-world performance of building integrated photovoltaic (BIPV) sunshades in federally owned buildings within GSA's inventory. The technology will be provided by Vitro Architectural Glass and OldCastle Building Envelope and coordinated with other ongoing evaluations of this technology.