

BIPV Technology

Building-integrated photovoltaics (BIPV) are photovoltaic materials that are used to replace conventional building materials in parts of the building envelope such as the roof, skylights, or facades. They are increasingly being incorporated into the construction of new buildings as a principal or auxiliary source of electrical power, although existing buildings may be retrofitted with BIPV modules as well. The advantage of integrated photovoltaics over more common non-integrated systems is that the initial cost can be offset by reducing the amount spent on building materials and labor that would normally be used to construct the part of the building that the BIPV modules replace. These advantages make BIPV one of the fastest growing segments of the photovoltaic industry.

The CIS Tower in Manchester, England was clad in PV panels at a cost of £5.5 million. It started feeding electricity to the National Grid in November 2005

HISTORY

PV applications for buildings began appearing in the 1970s. Aluminum-framed photovoltaic modules were connected to, or mounted on, buildings that were usually in remote areas without access to an electric power grid. In the 1980s photovoltaic module add-ons to roofs began being demonstrated. These PV systems were usually installed on utility-grid-connected buildings in areas with centralized power stations. In the 1990s BIPV construction products specially designed to be integrated into a building envelope became commercially available.

FORMS

Building-Integrated Photovoltaic modules are available in several forms.

- Flat roofs
 - The most widely installed to date is a thin film solar cell integrated to a flexible polymer roofing membrane.
- Pitched roofs
 - Modules shaped like multiple roof tiles.
 - Solar shingles are modules designed to look and act like regular shingles, while incorporating a flexible thin film cell.
 - It extends normal roof life by protecting insulation and membranes from ultraviolet rays and water degradation. It does this by eliminating condensation because the dew point is kept above the roofing membrane.
- Facade
 - Facades can be installed on existing buildings, giving old buildings a whole new look. These modules are mounted on the facade of the building, over the existing structure, which can increase the appeal of the building and its resale value.
- Glazing
 - (Semi)transparent modules can be used to replace a number of architectural elements commonly made with glass or similar materials, such as windows and skylights.

TRANSPARENT AND TRANSLUCENT PHOTOVOLTAICS

Transparent solar panels use a tin oxide coating on the inner surface of the glass panes to conduct current out of the cell. The cell contains titanium oxide that is coated with a photoelectric dye.

Most conventional solar cells use visible and infrared light to generate electricity. In contrast, the innovative new solar cell also uses ultraviolet radiation. Used to replace conventional window glass, or placed over the glass, the installation surface area could be large, leading to potential uses that take advantage of the combined functions of power generation, lighting and temperature control.

Another name for transparent photovoltaics is “translucent photovoltaics” (they transmit half the light that falls on them). Similar to inorganic photovoltaics, organic photovoltaics are also capable of being translucent.

Incentives

In some countries, additional incentives, or subsidies, are offered for building-integrated photovoltaics in addition to the existing feed-in tariffs for stand-alone solar systems.

Since July 2006 France offered the highest incentive for BIPV, equal to an extra premium of EUR 0.25/kWh paid in addition to the 30 Euro cents for PV systems. These incentives are offered in the form of a rate paid for electricity fed to the grid.

Source: <http://electrical-all.blogspot.in/2010/08/bipv-technology.html>