

# BUILDING INTEGRATED PHOTOVOLTAICS

## Summary:

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Building Integrated Photovoltaics are photovoltaic materials used in place of typical construction materials within the building envelop including facades, roof surfaces, PV tiles, and solar shingles, and skylights and solar shades incorporating transparent or semi transparent photovoltaics. Designing with BIPV, as opposed to non-integrated photovoltaics, can offset the high initial cost usually associated with renewable energy by reducing the cost of building materials and labor during construction.

## Resources:

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### **Books:**

#### **Building Integrated Photovoltaics: A Handbook**

by Simon Roberts and Nicolo Guariento

[http://www.amazon.com/Building-Integrated-Photovoltaics-Simon-Roberts/dp/3764399481/ref=sr\\_1\\_1?ie=UTF8&s=books&qid=1250028656&sr=1-1](http://www.amazon.com/Building-Integrated-Photovoltaics-Simon-Roberts/dp/3764399481/ref=sr_1_1?ie=UTF8&s=books&qid=1250028656&sr=1-1)

#### **Critical factors in reducing the cost of building integrated photovoltaic (BIPV) systems.: An article from: Architectural Science Review**

by Hatice Sozer and Mahjoub Elnimeiri

[http://www.amazon.com/Critical-reducing-building-integrated-photovoltaic/dp/B000T0FZQ0/ref=sr\\_1\\_2?ie=UTF8&s=books&qid=1250028656&sr=1-2](http://www.amazon.com/Critical-reducing-building-integrated-photovoltaic/dp/B000T0FZQ0/ref=sr_1_2?ie=UTF8&s=books&qid=1250028656&sr=1-2)

#### **Renewable Energy in the United States: Wind power in the United States, Solar power in the United States, Photovoltaics in the United States, Building-integrated ... photovoltaics, Biofuel in the United States**

by John McBrewster, Frederic P. Miller, and Agnes F. Vandome

[http://www.amazon.com/Renewable-Energy-United-States-Building-integrated/dp/6130022441/ref=sr\\_1\\_4?ie=UTF8&s=books&qid=1250086936&sr=1-4](http://www.amazon.com/Renewable-Energy-United-States-Building-integrated/dp/6130022441/ref=sr_1_4?ie=UTF8&s=books&qid=1250086936&sr=1-4)

#### **The impact of building-integrated photovoltaics on the energy demand of multi-family dwellings in Brazil**

by M. Ordenes, D.L. Marinoski, P. Braun, and R. Ruther

[http://www.amazon.com/impact-building-integrated-photovoltaics-multi-family-dwellings/dp/B000PKI0MK/ref=sr\\_1\\_6?ie=UTF8&s=books&qid=1250086936&sr=1-6](http://www.amazon.com/impact-building-integrated-photovoltaics-multi-family-dwellings/dp/B000PKI0MK/ref=sr_1_6?ie=UTF8&s=books&qid=1250086936&sr=1-6)

#### **Designing with Solar Power: A Source Book for Building Integrated Photovoltaics**

by Deo Prasad and Mark Snow

[http://www.amazon.com/Designing-Solar-Power-Integrated-Photovoltaics/dp/1844071472/ref=sr\\_1\\_10?ie=UTF8&s=books&qid=1250086936&sr=1-10](http://www.amazon.com/Designing-Solar-Power-Integrated-Photovoltaics/dp/1844071472/ref=sr_1_10?ie=UTF8&s=books&qid=1250086936&sr=1-10)

## Products:

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### **Suntech Power**

Suntech Power, founded in 2001, is an international manufacturer of photovoltaic modules with sales offices and installation partners in North America, Europe, Asia, and Australia. Suntech's America is located in San Francisco, CA and their corporate headquarters is located in China. Suntech has developed a range of photovoltaic options including their monocrystalline solar panels, polycrystalline solar panels, semi-transparent modules, and building integrated photovoltaic (BIPV) panels.

## Case Studies:

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### **Exelon Pavilions, Millennium Park**

Located in downtown Chicago, IL, the four Exelon Pavilions are an integral part of Millennium Park, with two located on the south side of the park and two on the north. The south side pavilions, designed by Renzo Piano, provide access to the parking garage below while incorporating solar technology: twenty-four PV modules are located on the roof of the southeast pavilion and 16 PV modules are located on the roof of the southwest pavilion.

### **McDonald's Cycle Center, Millennium Park**

The cycle center is located in downtown Chicago's Millennium Park and "is another step toward Mayor Daley's goal to make Chicago the most bicycle-friendly city in the country." The center provides 300 secure, heated, indoor bike parking spaces, showers and lockers, bike rentals, and a repair shop. The center is also partially powered by the photovoltaic system on the roof including 80 75-watt modules and 40 37-watt modules. The system is rated at 7.48 kW, will generate 8,815 kilowatt-hours per year, and meet 6.5% of the center's electrical requirements.

### **Chicago Center for Green Technology**

CCGT, located west of Chicago's Loop, acts as a model for green construction, houses green businesses and organizations, and provides a place to learn about sustainability. It is only the third building in the United States to be designed with the highest standards of green technology, LEED Platinum, though it is the first LEED Platinum building to reuse an existing structure and provide public transportation. The building that houses CCGT was built in 1952 and was most recently owned by Sacramento Crushing.