

# Sustainable Buildings and BIPV: An international perspective

BIPV 2: Building integration of photovoltaics  
Where are we now, and what does the future hold for  
BIPV?

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Prof. Dr. Arch. Silke A. Krawietz



SETA Network

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## Challenges and Opportunities for GREEN CITIES

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Since **2007**, more than **50%** of the world's population  
now lives in cities

By **2050**, nearly **70%** of all the earth's inhabitants will  
be living in urban areas.

(Source: Unep, 2011)

Cities consume

more than **75%** of the world's natural resources;  
use **60-80%** of the world's energy and are  
responsible for **75%** of its carbon emissions.

Rio+20 will be a great opportunity!

## EU Policy and meeting the targets

The EU is working to reduce the effects of climate change and establish a common energy policy. By 2020 renewable energy should account for 20% of the EU's final energy consumption.

EU Targets until 2020:

- 20% Renewable Energies
- 20% Energy Efficiency increase
- 20% Reduction of CO<sub>2</sub>

The Energy Performance of Building Directive (EPBD) is a unique opportunity to incorporate energy efficient and renewable energy technologies, such as BIPV applications into buildings.

## BIPV and NetZero Energy Buildings

NetZeroEnergyBuildings are highly energy efficient buildings that use renewable energy to produce at least as much energy as they consume over the course of a year.

- Highly insulated / well sealed building envelope
- Energy efficient heating & cooling systems, as well as lighting and appliances
- Remaining energy is generated by PV or other renewable energies.

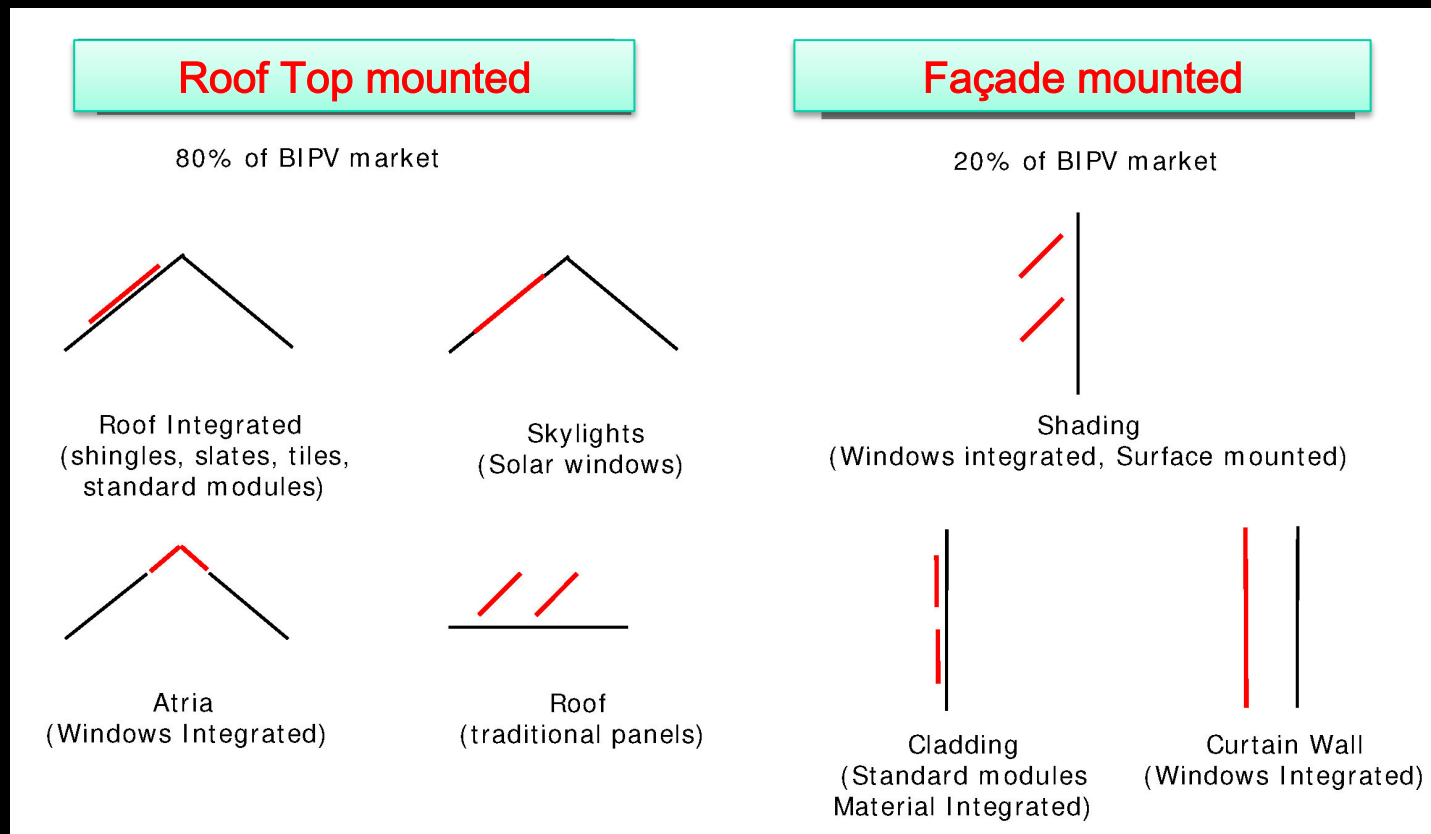


## BIPV DESIGN CONSIDERATIONS

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### BIPV Applications / Replacement of conventional building elements

- Facades
- Roofs (skylights, solar shingles/tiles, roofing systems)
- Balconies/awnings
- Other building elements



# Architectural PV components / Facades

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# Roofs / skylights

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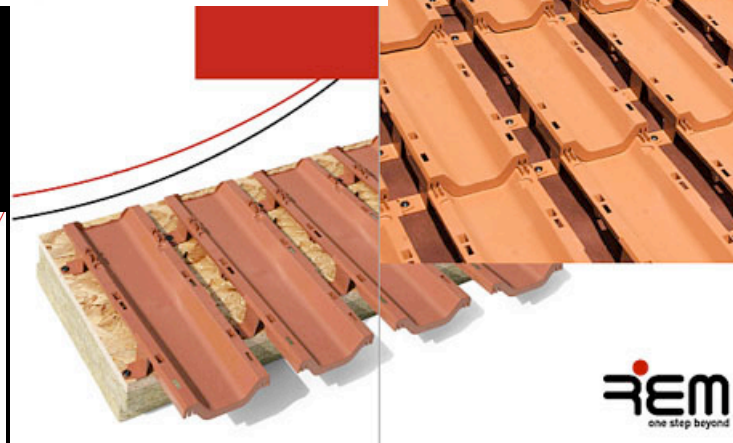
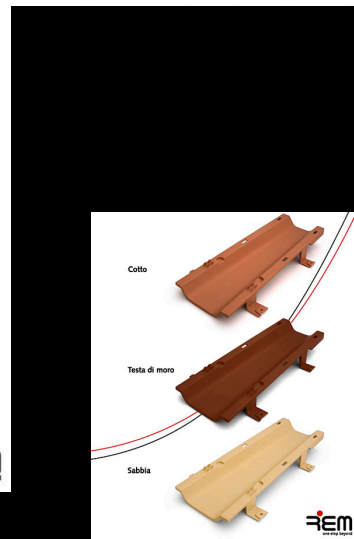
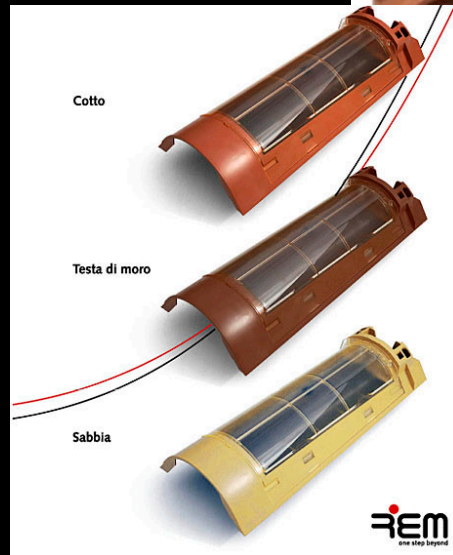


# Balconies

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# PV Tiles



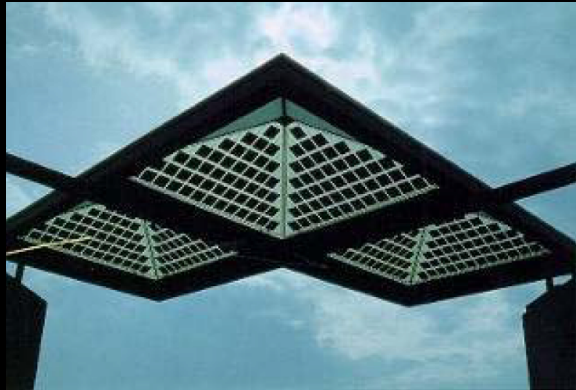
# Shadowing systems

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# Architectural PV Components Urban Furniture

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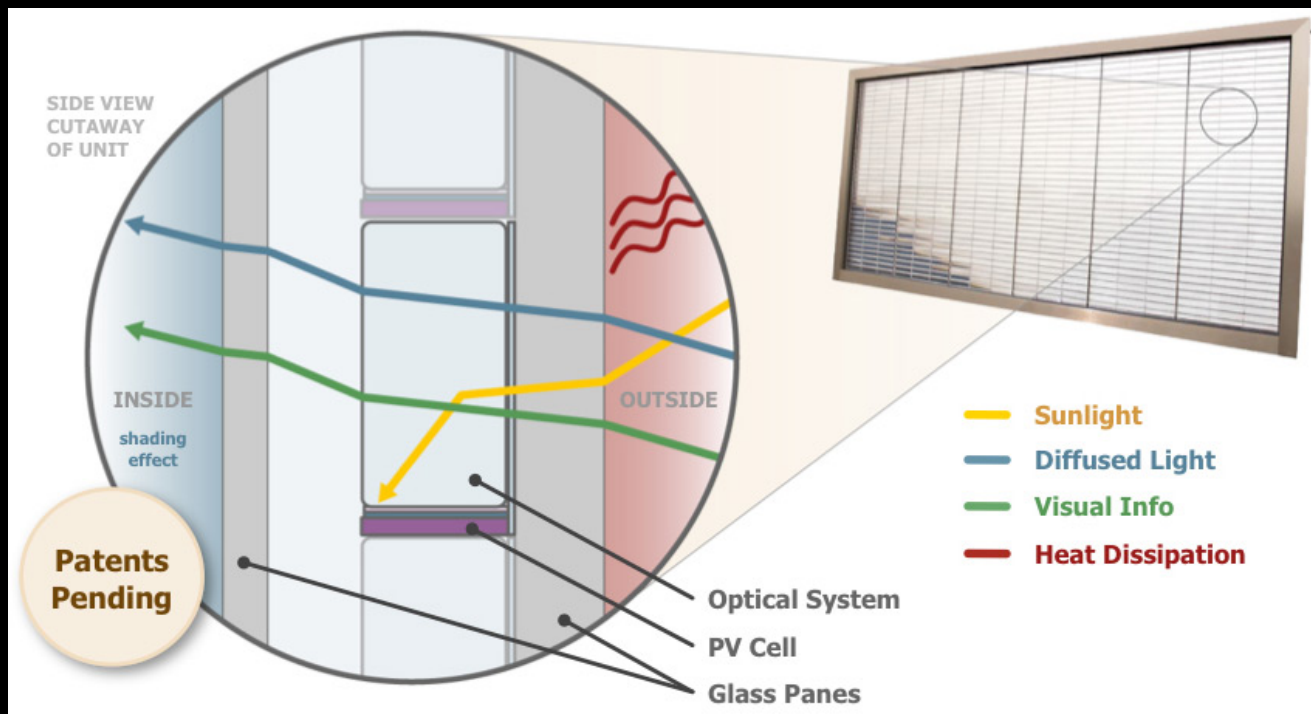
# Architectural PV Components Urban Furniture

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# INNOVATIVE BIPV SYSTEMS – Examples

## Pythagoras window



*Pythagoras solar window technology - BIPV.  
(Source: Pythagoras-Solar.com)*

## INNOVATIVE BIPV SYSTEMS – Examples

### Beijing Façade GreenPix

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Source: Giostra & Partners

Architects: Simone Giostra & Partners with Arup





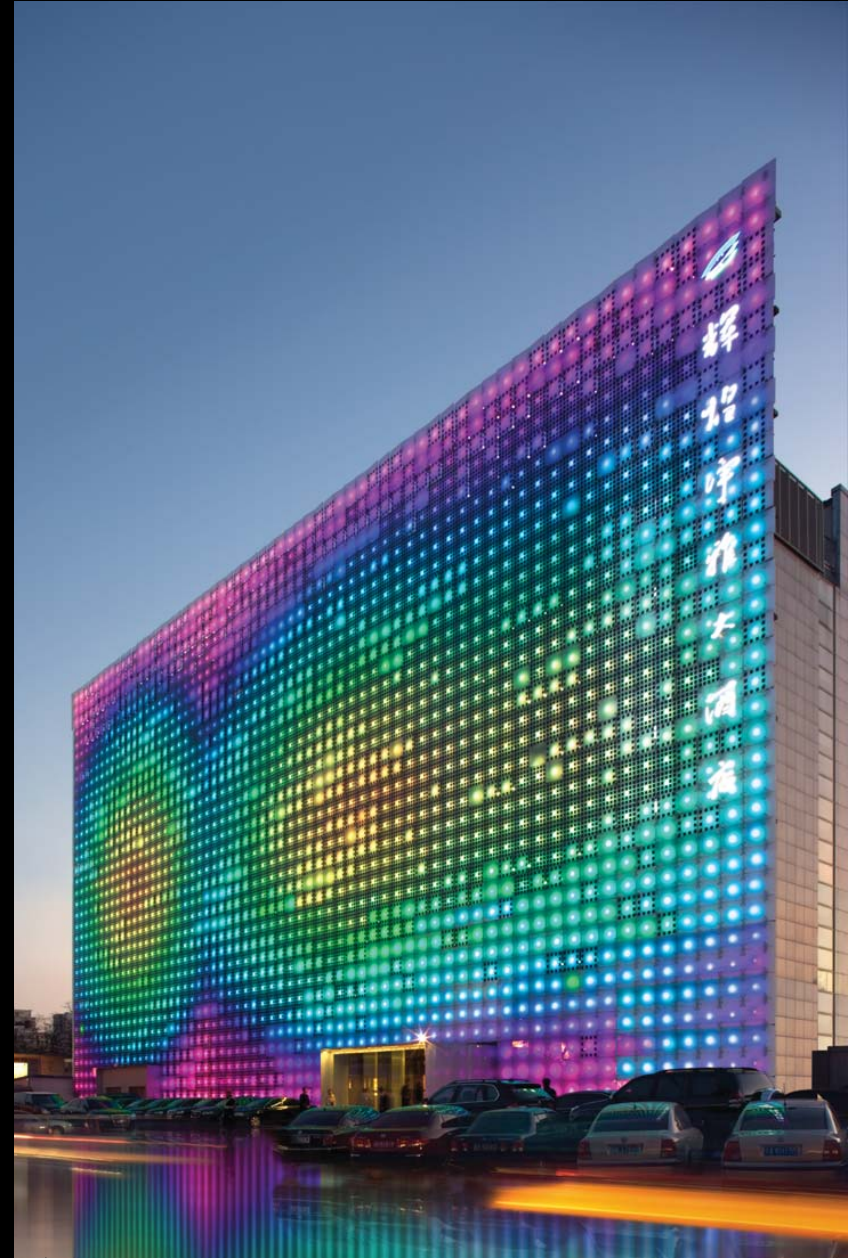
Source: Giostra & Partners

GreenPix, Beijing – Media Wall



Area FV 534 m<sup>2</sup>  
Produced Energy: 38,929 kWh/a  
Module size: 890 x 890mm  
Technology: Polycrystalline Silicon  
Sunways,  
Schueco & Suntech  
Completed: 2008  
Architects: Simone Giostra &  
Partners Inc.  
Engineering: Arup

Source: Giostra & Partners

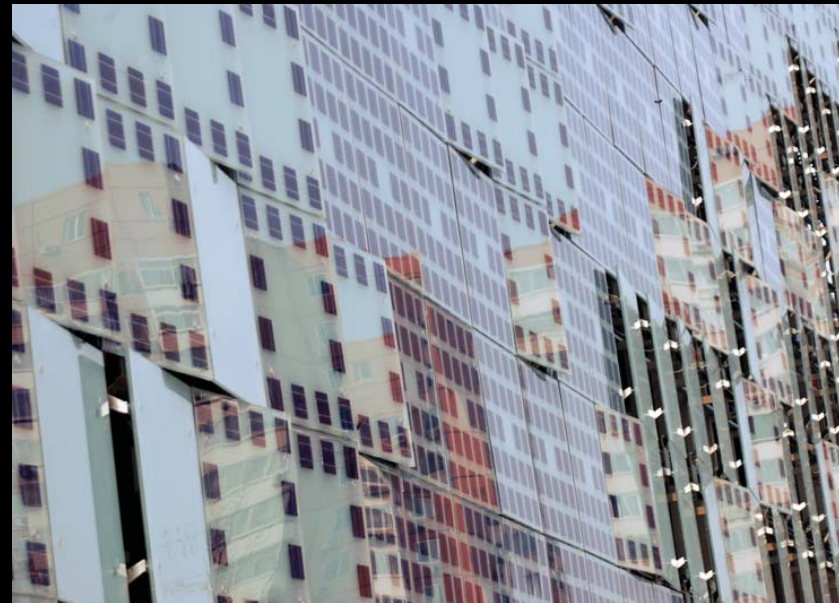


The Media Wall, Projecting Media Art Concept

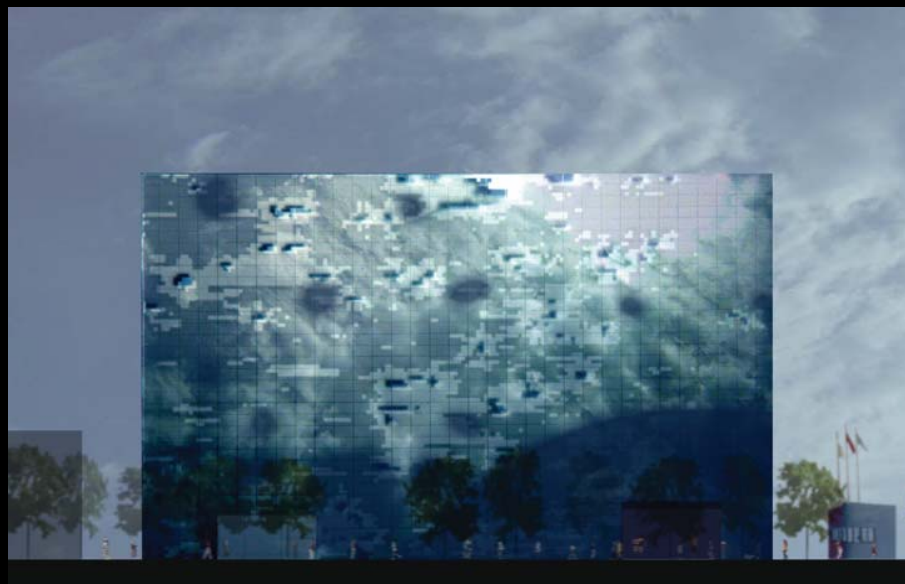
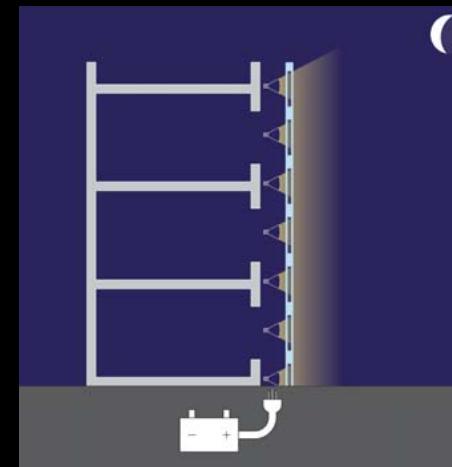
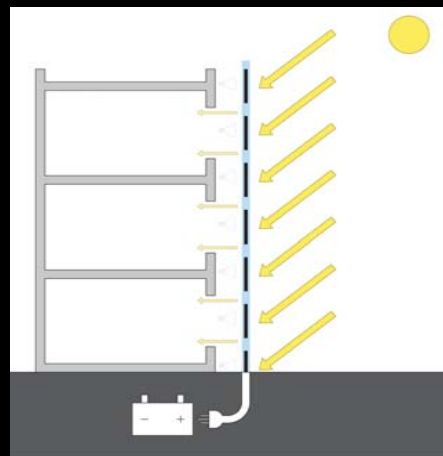
## GreenPix – Zero Energy Wall



Media Wall Reflecting Different Light Conditions



GreenPix – Zero Energy Media Wall



The New Façade: Midday



The New Façade: Midnight

## GreenPix, Beijing – Media Wall

## FUTURE OUTLOOK AND CONCLUSIONS

- ◆ MORE CHOICES OF INNOVATIVE PRODUCTS for new buildings
- ◆ MORE CHOICES OF RETROFITTING ARCHITECTURAL COMPONENTS for existing building stock
- ◆ INCREASE THE BIPV MARKET
- ◆ COST REDUCTION FOR BIPV IS ESSENTIAL
- ◆ COLLABORATION BETWEEN ARCHITECTS, DESIGNERS AND PV INDUSTRY

**LET'S BE INNOVATIVE  
AND LOOK INTO THE BIPV FUTURE !**

**Thank you!**

**Prof. Silke A. Krawietz  
SETA Network**

**Email: [seta@gmx.net](mailto:seta@gmx.net)**