BIPV from a PV supply side perspective

BIPV: from demonstration to implementation

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INTRODUCTION OF SOLTECH

company specialized in the production of customized photovoltaic modules

created as spin-off of IMEC in 1989

high investment in research & development

total system engineering
autonomous applications
grid connected BIPV

production of customized and
high quality solar panels

prototyping

project related customized modules

dedicated production runs

Located in Tienen, België
Off Grid Applications
We believe that the building skin will have to be active

- Keep the ‘classic’ functionalities
  - watertight, insulation (thermal, acoustic)
  - humidity regulation, mechanical aspects
  - light comfort, safety,…

- Add additional functions
  - production of energy (electrical, heat)
  - sensors
  - communication
  …

We divided the BIPV-materials in two different types

- Customized BIPV-modules for special projects
  -> Actual commercial market
     high price
     high added value

- Standardized building products
  -> Only way to come to market penetration
     reasonable cost
     high volume production possible
BIPV-projects

- Customized PV-panels dedicated to one specific building
- Every project needs his own engineering
- Large flexibility in choice of materials, processes, colors, size, ...
- Not necessarily in competition with standard PV (image building)
- For every project the functionalities have to be taken in account: influence of the BIPV on the building electrical, heat, comfort,...
Large product range available
- Certified up to 6m²
- Complete freedom of cell positioning, light transmission, heat transmission, ...
- All glass types possible
  - Insulation
  - Color
  - Reflective coatings
  - Safety

Although customized, totally certified as well as photovoltaic element and as building element with all his functions

A. PV standards
- IEC/EN 61215
- IEC/EN 61730-1 and IEC/EN 61730-2
- Periodic factory inspection TUV
- MCS (UK)

B. Building standards
- EN12543-4
  - High temperature test
  - Humidity test with condensation
  - Radiation test (UV)

- EN12600: Pendulum test (safety), classification 1B1
- Avis technique (France): to be evaluated per project (ATEX)
- CE : EN12543 parts 1 to 6 et EN 14449
BIPV-projects

Facades

Pioneer projects

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Customized projects

Project CEDUBO

- Heusden-Zolder (Belgium)
- Realization in 2001
- Area: 150m²
- Power: 15kWp

Renovation old building Lightstreet
Customized projects

Bio Incubator - Tienen

- Area: 463 m²
- Power: 60kWp
- Realization 2012

Shading elements
Customized-projects

- Power: 28,56 kWp
- Area: 465 m²
- Realization: 2012
- Partners: Ecotemis and Loison
- Owner: Ville de Paris
- Architect: Studio Milou

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Customized-projects

City Mortsel - BE

Canopy
- Power: 134,85 kWp
- Area: ±1300 m²
- Year of realization: 2012
- Partner: AGC Glass Europe
- Final customer: City of Mortsel
- Architect: ABSCIS architecten
Customized projects

OCMW Beersel - BE

Supply of Photovoltaic sun Shade Louvers

- Power: 18 kWp
- Year of realization: 2012
- Partner: Colt International
- Final customer: Stad Beersel
Ecole Marcel Pagnol
Project client Quenea

Area: 240m²
Power: 19,7kWp
Slope: 10°
Cannes (FR)
Realization: 2013
EDF ENR Solaire

- **Power:** 195 kWp
- **Solar area:** 1350m²
- **Year of realization:** 2013
- **Partner:** Energis (Rennes)
Customized projects

Shading elements
Bellegarde sur Valserine et Vénissieux - 2013.

Sonil
Customized projects

Eau de Paris

Site Orly

- Power: 75,75 kWp
- Area: 630 m²
- Realization: 2012
- Partner: Cegelec Paris
- Owner: Eau de Paris
- Architect: ALP CAR Architectes

Facade of industrial area
MFO Erasmus Universiteit

- Area: 285m²
- Power: 25,2kWp
- Realization: 2014
- Rotterdam (NL)
Customized projects

Jahra Court Complex - Kuwait

- Area: 1525m²
- Power: 95kWp
- Realization: 2015
- Partners: IQ-Tech - Clenergy
- Architect: Fentress
BIPV-products

Standardized building elements

Product characteristics
- Very detailed, far-reaching engineering
- Production possible at large scale
- Easy project-design without additional engineering
- Standardized packages with installation that doesn’t need to be done by specialists - Plug & Play

Our challenges
- Maintain the full functionality
- Esthetics
- Easy to install
- Cost in competition with standard BIPV

Our experience
- Often an intrinsically more expensive product
- Cost reduction possible
- Avoided cost materials that are replaced
- Fast / easy mounting
- Savings on mounting structure

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BIPV-products

**Standardized building elements**

- Up till now different versions/variations/trials/demonstrations
- Limited penetration on the market due to low volumes – high prices
- Last few months a high increase in interest from the market
  - Who? - general contractors
  - - suppliers/manufacturers of building materials
  - - big installers
  - Why? - requirements for buildings
  - legal obligations on energy performance
- Gamechanger the coming months/years
  - The pressure/demand now seems to be high enough to allow
    - engagements on volume
    - investments to reduce the cost
Case I BIPV-product - Solar Slate

- *Eternit Solesia*®

  actually: 40Wp/module ± 5%

The solar slates are replacing the standard slates
Case I BIPV-product - Solar Slate

**Positive**
- Flat surface
- Esthetics
- Easy project integration - sides in traditionnal materials

**Costs**
- No mounting structure
- Fast mounting
- Avoided material and mounting cost
- No frame needed
Case I BIPV-product - Solar Slate

Challenges

• Panel size
  • by changing from 1 row of cells to 2 rows of cells a module cost reduction of 40% (and for 3 rows even 55%) can be achieved
  • This leads to an adaptation of the ‘standard’ slate size and overlap ‘habits’

Volume

Number of slate roofs is limited (competition traditionnal tiles)

Next generation will be price competitive with standard panels at installed system level
Case II BIPV-product - Aerspire Energy Roof

- Mounting system developed by Aerspire (the Netherlands)
- Glass/glass modules mounted on rails
- Fixation on the back of the module
- Frameless overlapping modules (1m X 1,7m)
Case II BIPV-product - Aerspire Energy Roof

Positive

Flat surface

Esthetics

Long lifetime (glass/glass)

Good ventilation concept

Costs

60 cells-panel > cost optimum

Easy mounting structure

Fast mounting

Avoided material and cost

No frame needed
Case II BIPV-product - Aerspire Energy Roof

- **Challenges**
  - Still *project engineering* necessary
    - -> sides have to be tailormade
  - Cost sides
  - Volume

Concept is mainly for projects with several similar houses
Example: demonstration project with Heijmans

© Aerspire
BIPV: from demonstration to implementation

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