

# BUILDING INTEGRATED PHOTOVOLTAIC (BIPV): TRAINING WORKSHOP AND GUIDED TOUR

## Introduction PVSITES project

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Empa Dübendorf, 13 Nov 2019



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# PVSITES: Quick facts

**Funding EU:** 5.47 M€ (+ 1.4 M€ Switzerland)

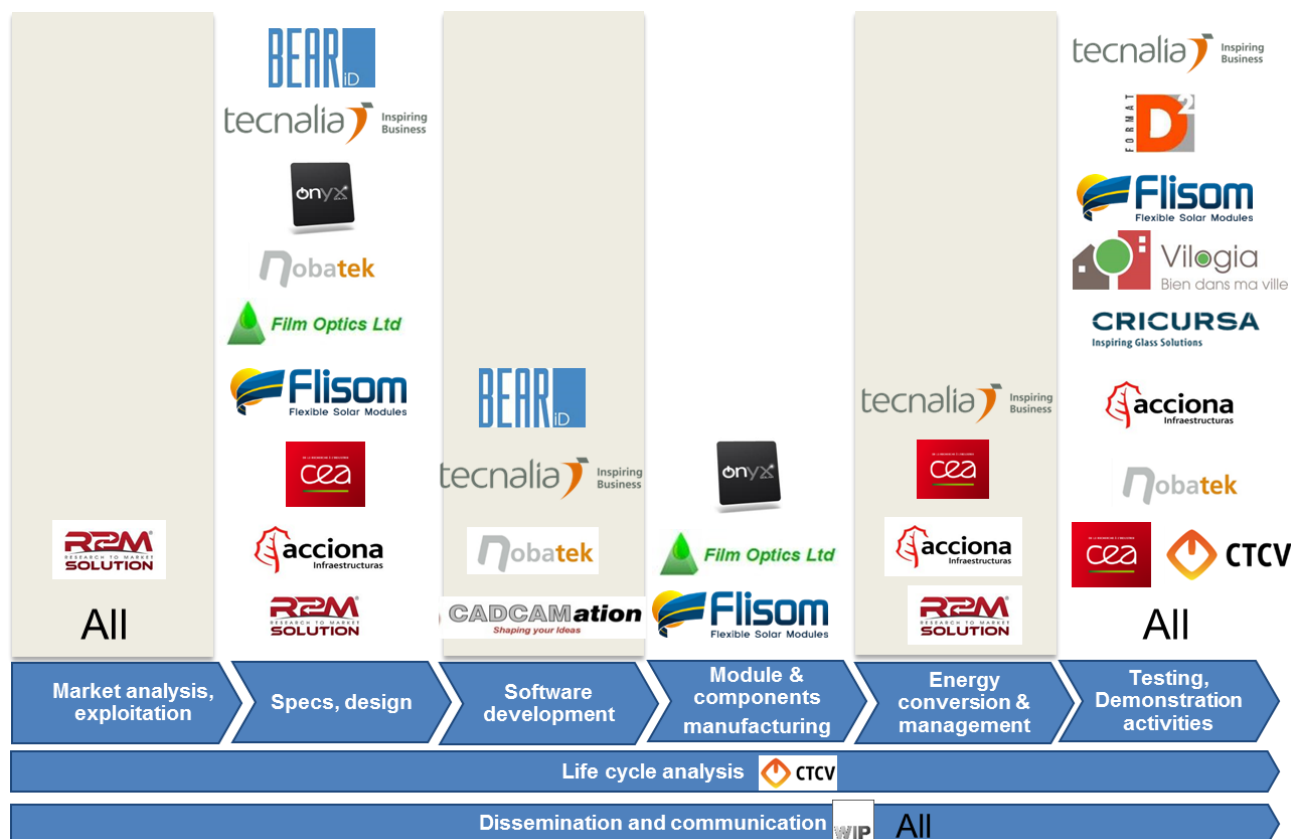
01/01/2016 – 30/06/2020

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**Coordinator:** Tecnalia R&I  
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## 15 partners

Spain (4)  
France (3)  
Switzerland (2)  
Portugal (1)  
Germany (1)  
Italy (1)  
Netherlands (1)  
Belgium (1)  
UK (1)



# PVSITES: Objective and challenges

**General objective: To drive BIPV technology to large market deployment led by EU industry**

To be achieved by:

- Identifying and addressing BIPV market / business requirements
- Demonstrating in real buildings (TRL5 to TRL6-7) an **ambitious portfolio of BIPV solutions** in terms design and simulation, architectural integration, performance, cost-effectiveness, grid integration, energy management, LCA, training and awareness

## Market challenges

Enhanced flexibility of design, outstanding aesthetical value, multi-functionality and cost-effectiveness

Assistance to design phase through the joint simulation of BIPV products and building energy performance

More predictable, manageable, grid-friendly profitable BIPV generation

Demonstration of performance and reliability of BIPV solutions through effective incorporation onto real buildings

# PVSITES: challenges

**Challenge:** Enhanced flexibility of design, outstanding aesthetical value, multifunctionality and increased performance

**Solution:** A wide portfolio of BIPV products based on c-Si and CIGS technologies complying with market requests



Glass–glass crystalline silicon based solutions (ONYXSolar), developed in PVSITES



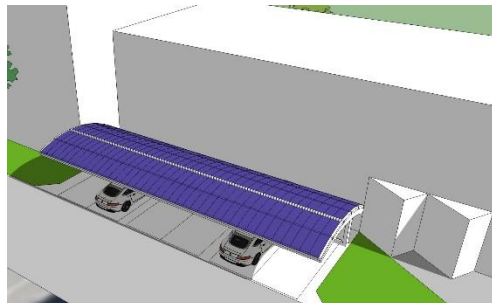
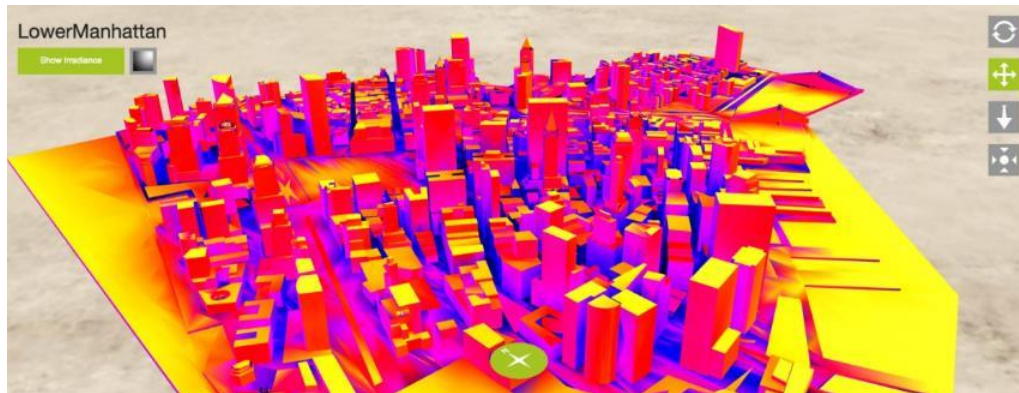
CIGS on metal BIPV modules (FLISOM), developed in PVSITES



# PVSITES: challenges

**Challenge:** Software tool for the joint simulation of BIPV products and building energy performance

**Solution:** An accurate, user-friendly, integrated SW tool for the simulation of BIPV products performance and their impact on building energy demands





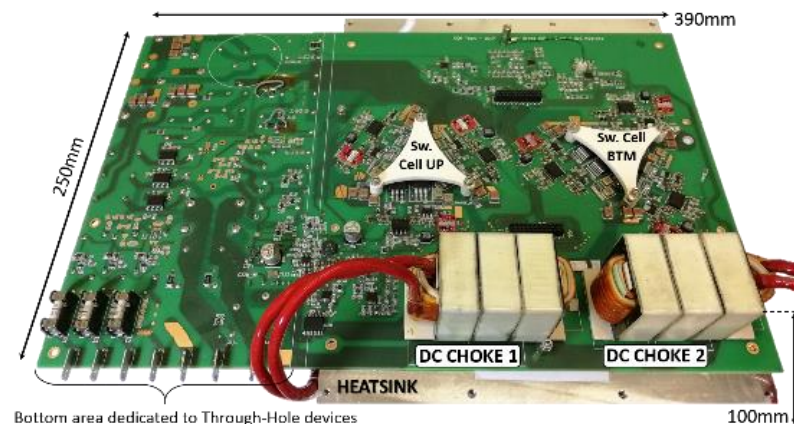
# PVSITES: challenges

**Challenge:** More predictable, manageable, grid-friendly and profitable BIPV generation

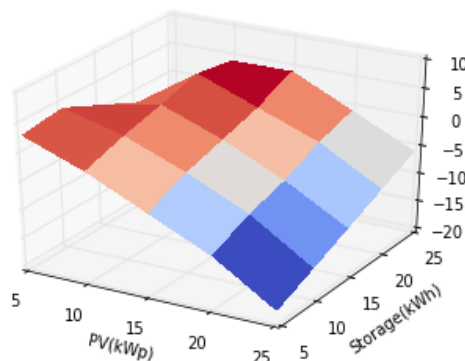
**Solution:** A combination of flexible and high efficiency grid interface for BIPV systems and new building energy management strategies.



DC/AC converter,  
TECNALIA



CEA's inverter printed circuit-board with  
surface-mounted electronic components



Planner tool, TECNALIA

# PVSITES: challenges

**Challenge:** To demonstrate reliability of advanced BIPV solutions through effective incorporation onto real buildings

**Solution:** High impact, replicable demonstrations and training activities in real buildings and experimental facilities throughout Europe

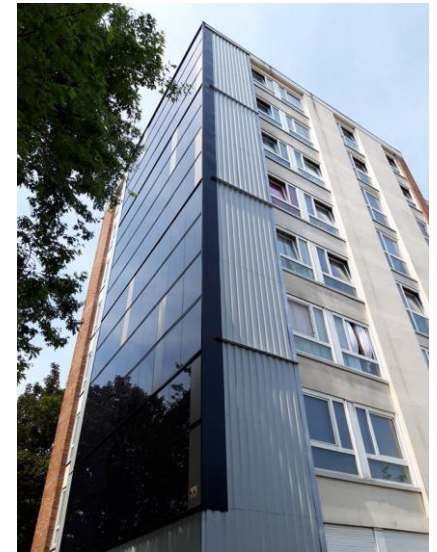


Carport, Zürich (SW)

Roof, Stambruges (BE),  
residential

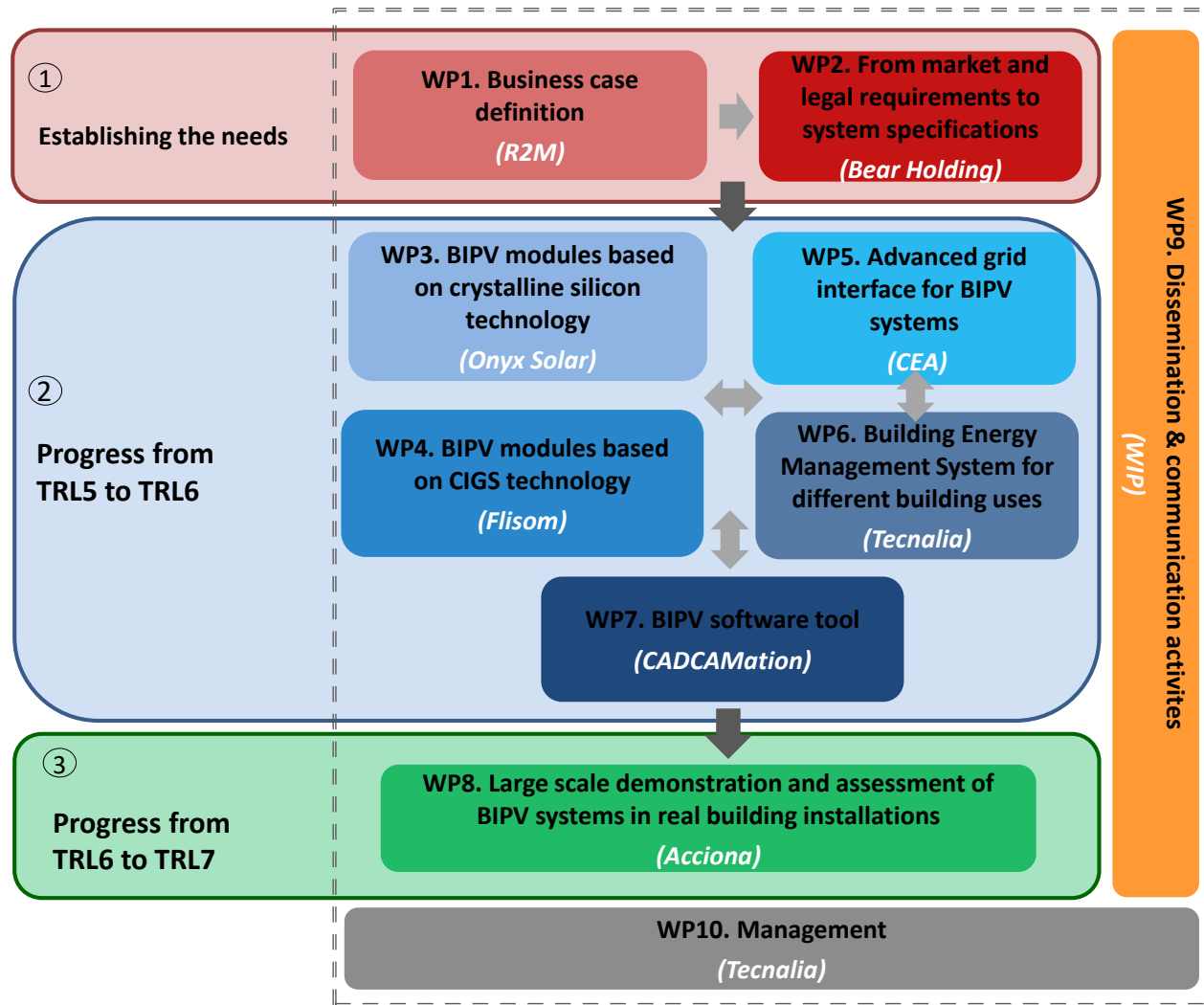


Opaque facade, Wattignies (FR),  
social housing



# PVSITES: Implementation

## WorkPlan





# PVSITES: Achievements (PV techs)

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## Market related activities:

- Market and stakeholder analysis conducted.
- Assessment of regulatory framework
- Application of the new BIPV standard, EN 50583 (2016)
- Analysis of exploitable results (26 ERs, with commerc., IPR paths).
- Standardization needs for project results.
- Business models for BIPV.
- Global risk assessment.
- ...

# PVSITES in the market

## PVSITES in the market – CIGS products



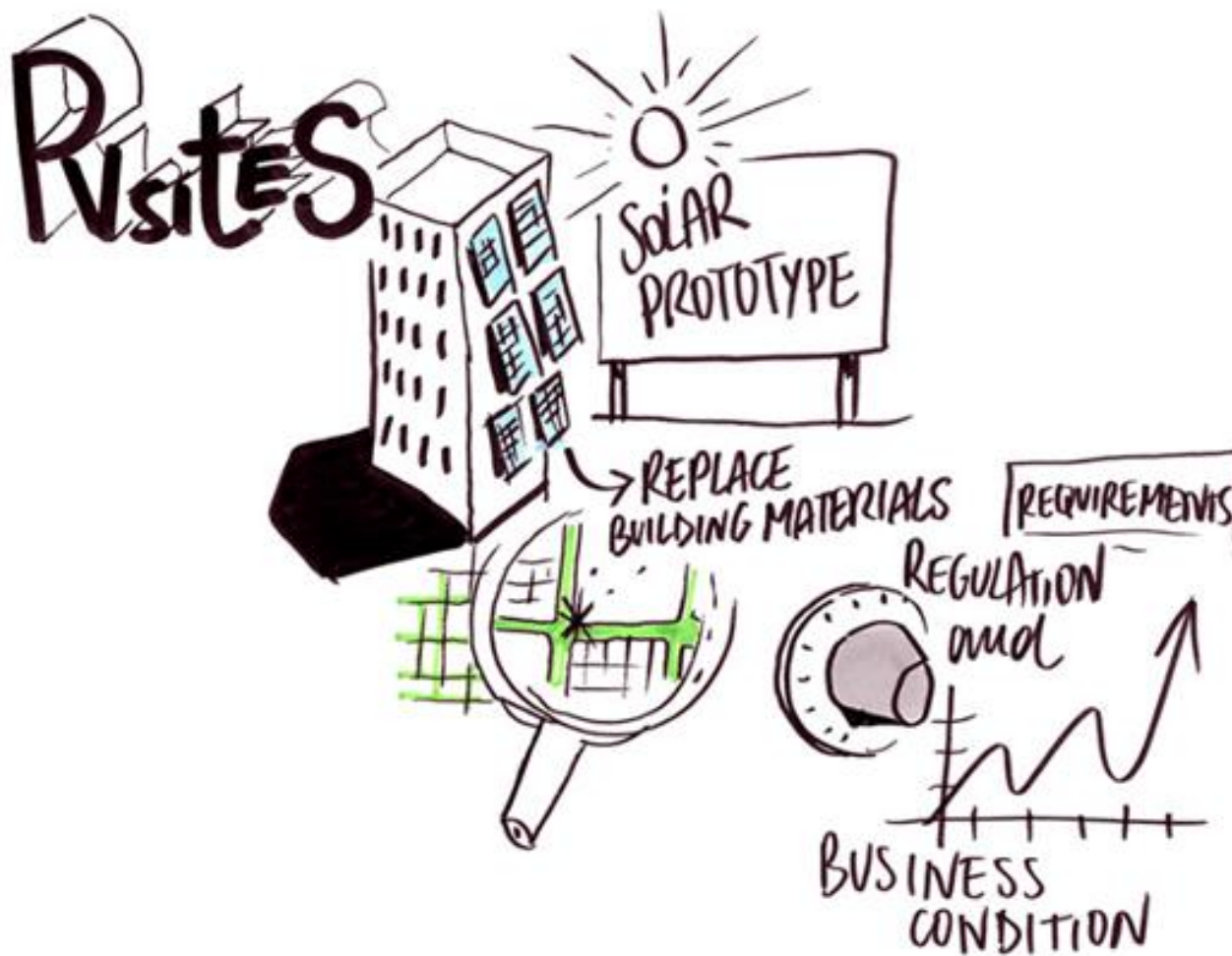
250 kW installation of e Flex CIGS  
product (FLISOM)  
in a flowers market in Johannesburg  
(SA)

# PVSITES in the market

## PVSITES in the market – c-Si products



Black frit PVSITES modules in Atic in Castle Lane Street, close to Buckingham Palace, London (Onyx Solar)





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